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# Evaluation of the Effect of a Behavioural Coaching Intervention on Faculty Adoption of Technology-Enhanced Teaching Practices

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## Abstract

College faculty members face increased pressure to incorporate technology into their teaching approach. However, without the support of comprehensive professional development, it is unlikely that they will adopt effective practices that enhance student outcomes. The purpose of this study was to evaluate the impact of a behavioural coaching intervention comprised of goal setting, performance feedback, modeling, instructions, and rehearsal on faculty adoption of technology-enhanced teaching practices. A small group of college faculty members (n= 6) participated in weekly coaching sessions for the duration of one academic semester. A changing criterion design was used to evaluate the effects of the intervention. Results suggest that the intervention was successful. All participants adopted new technology-enhanced teaching practices over the course of the intervention. In addition, participants reported high levels of satisfaction with the intervention and significant changes in knowledge related to incorporating technology-enhanced teaching practices within their classroom. Limitations and suggestions for future research are discussed.

## Keywords

Behavioural coaching, technology-enhanced teaching, behavioural skills training, goal setting, performance feedback, faculty professional development

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# Chapter 1

## 1 Introduction

Technology has become ubiquitous within our daily lives. Where we once used paper maps to help us navigate to an unfamiliar location, we now rely on global positioning systems (GPS) or virtual mapping applications. When we want to learn how to do something unfamiliar, we no longer look to those people we personally know who might have the expertise we need. Instead, we “Google” it and in a matter of seconds, have access to an amount of knowledge that was incomprehensible just twenty years ago. The world of post-secondary education has not been immune to the influence of technology. Online and blended course delivery options are becoming more popular, with many institutions offering entire credentials via the online platform (Dobbins, 2009; Swan, Day, Bogle, & Matthews, 2014). While the prevalence of technology use in post-secondary education has increased, it is occurring at a slower rate than might be expected and has often been confined to the adoption of learning management systems rather than the re-design of the teaching and learning experience (Marshall, 2010).

Within post-secondary education, the responsibility for course development lies with faculty members who are, generally speaking, hired based on their exemplary content knowledge (Romano, Hoelsing, O'Donovan, & Weinsheimer, 2004). They are not necessarily pedagogical or technological experts (Koehler & Mishra, 2009; Schwartz & Gurung, 2012). As such, incorporating technology-enhanced approaches to teaching within the college system is a challenge (McLoughlin, Wang, & Beasley, 2008). Without sufficient planning and expertise, faculty attempts to incorporate technology into teaching may amount to a series of add-ons that fail to enhance the learning experience of students (Edwards, Kirwin, Gonyeau, Matthews, Lancaster, & DiVall, 2014; Kinchin, 2012; Vaughan, 2004). Experienced faculty may resist the adoption of new teaching techniques (Johnson, 2013; Koehler & Mishra, 2009), and institutional barriers to change can deter those teachers who are willing to experiment with alternative teaching methods (Johnson, 2013; McLoughlin, et al., 2008). In addition, some faculty members who have adopted technology-enhanced teaching practices report that their colleagues disapprove of their innovation (Johnson, 2013).

Taken together, these factors make it unlikely that college faculty will spontaneously adopt effective, innovative, technology-enhanced teaching practices on a large scale without the support of a professional development plan.

A vast and diverse array of research on training exists. The concept of training being delivered through a mentoring model is common within the faculty professional development literature (Boyle & Boice, 1998; Brooks, 2010; Dobbins, 2009; Haviland, Shin, & Turley, 2010; Huston & Weaver, 2008). Within these studies, small groups of faculty members come together with the goal of changing some aspect of their teaching practice. Meetings are typically held weekly for the duration of an academic semester or year and a collegial, collaborative relationship amongst group members is often described.

Different approaches to training are taken within the field of applied behaviour analysis (ABA). Specifically, behavioural skills training (BST) and behavioural coaching procedures have been used to train a wide variety of skills to children, athletes, parents, and staff (Gross, Miltenberger, Knudson, Bosch, & Breitwieser, 2007; Hine, 2014; Homlitas, Rosales, & Candel, 2014; Martin, Thompson, & Regehr, 2004). Both of these approaches can be delivered individually or in small groups. Regardless of the size of the training group, these approaches typically have an instructor with expert knowledge directing the training intervention. The duration of the training program is dependent on the participant's performance. Once the trainee achieves a pre-determined level of skill, the intervention is concluded.

Valuable information may be gleaned from the faculty development research literature. Insight into how participants should be selected, how topics are determined, and how often groups should meet have all been addressed by authors in this arena. The ABA literature provides insight into specific behavioural techniques that can be used to effect observable change in participants' behaviour. Suggestions for how to describe and measure behaviours are plentiful within this paradigm. In addition, the important influence of goal setting on performance is identified (Hayes, Rosenfarb, Wulfert, Munt, Korn, & Zettle, 1985; Latham & Locke, 2007; Locke & Latham, 2006).

Although many research studies from the faculty professional development literature describe successful outcomes, they often rely on retrospective self-reports to evaluate their

efficacy (Edwards et al., 2014; Haviland et al., 2010; Popovich, Peverly, & Jackson, 2006). This raises the question of the validity of the results. Applied behaviour analytic approaches objectively assess behaviour change; however, they do not take the collaborative approach to change that is recommended within the faculty professional development literature. To date, ABA approaches to changing teaching behaviours have not been empirically validated with college faculty members.

In an environment of shrinking professional development budgets and increasing pressure to innovate, the development and delivery of effective, efficient training programs is necessary within higher education. Applied research studies that empirically test the impact of training interventions can provide valuable information to leaders within higher education, helping to ensure the best possible return on their training budget investments. The goal of this study is not to evaluate the merits of technology integration within classrooms in higher education. Rather, the goal is to identify an approach that can facilitate the adoption of technology-enhanced teaching practices in institutional settings where the administration has made this a priority.

This study will attempt to contribute to the knowledge base by developing, implementing, and evaluating the impact of an individualized behavioural coaching intervention on faculty adoption of technology-enhanced teaching practices. Direct observation of faculty teaching behaviours, as well as individual faculty reflection, will provide the data to evaluate the training program.

## Chapter 2

### 2 Literature Review

#### 2.1 Best Practices in College Teaching

When asked to visualize what teaching looks like in colleges and universities, many people would likely imagine a professor lecturing at the front of a large classroom. This perception is not surprising given that lecturing remains the most common instructional approach within higher education (Lumpkin, Achen, & Dodd, 2015). Many of the physical spaces within institutions have been built to efficiently direct the attention of audience members to an expert at the front. These environments communicate the message that learning is about listening and acquiring information (Weller, 2011). They encourage students to assume a passive role, deferring to the expertise of their instructors.

While lecturing may be the most common teaching method in higher education, research shows that it is not always the most effective pedagogical approach (Freeman et al., 2014; Prince, 2004; Wieman, 2014). Active learning is an alternative teaching approach that “requires students to do meaningful learning activities and think about what they are doing” (Prince, 2004, p. 223) rather than passively listening to a lecture. Compared to the traditional lecture approach, courses taught with an active learning approach produce a 12% reduction in the course failure rate and an increase of 6% on exam scores (Freeman et al., 2014). Active learning improves students’ long-term memory for course concepts (Cherney, 2008) and higher level critical thinking skills (Linton, Farmer, & Peterson, 2014; Nelson & Crow, 2014; Richmond & Hagan, 2011). Students are more engaged at institutions where faculty use active learning principles in their teaching practice (Umbach & Wawrzynski, 2005), and faculty members described as “master teachers” (Buskist, 2004, p. 24) adopt an active learning approach to develop thinking and problem-solving skills in their students rather than transmitting facts and figures.

Student perceptions of active learning are generally positive. Students report that active learning approaches increase their understanding of course material (Cavanagh, 2011;

Lumpkin et al., 2015; Miller & Metz, 2014), help to keep their interest and attention, and increase their motivation for the course (Cavanagh, 2011). Students also indicate that they believe active learning approaches will improve their exam scores and they enjoy the experience (Miller & Metz, 2014). Even when students are silent or choose not to overtly participate in classroom activities, they still report benefits and enhanced learning from the active learning approach (Obenland, Munson, & Hutchinson, 2012).

Not all students report positive active learning experiences. A study by Herrmann (2013) on the impact of an active learning approach in small group tutorials found student perceptions varied from mostly positive to mostly negative based on the specific tutor facilitating the sessions. This suggests that adding structural elements of active learning without ensuring the instructor has the appropriate facilitation skills may result in less positive results.

With the advent of new technologies, the availability of inexpensive, powerful mobile devices, access to Wi-Fi, fast download and upload speeds, and the widespread use of Learning Management Systems (LMS's) within higher education, there is the potential to develop active learning exercises that will engage students in more creative ways than has been possible in the past. While these tools and technologies offer exciting possibilities, they can be difficult to integrate into practice. To maximize the positive impact of technology, faculty members must link technological, content, and pedagogical knowledge (Koehler & Mishra, 2009) during the course and learning activity design period. Faculty members must have time to reflect on how their pedagogy impacts their practice. They must select the right technology, for the right, task at the right time. They should have the opportunity to collaborate with their peers over a sustained period of time to share knowledge and resources (Keppell, Suddaby, & Hard, 2015) and work to ensure that technological add-ons result in actively-engaged students.

Emerging best practices in higher education may include technology-enhanced active learning where faculty members develop learning opportunities that require students to critically consider course content. While new technologies have the potential to re-shape higher education, the instructional design component is challenging work that will not occur without systematic professional development and support.

## 2.2 Faculty Training Programs

Numerous journal articles have been published describing faculty professional development programs. Many have focused on the role of mentoring or coaching relationships as a means of enhancing faculty skill (Dobbins, 2009; Haviland et al., 2010; Hixon, Buckenmeyer, Barczyk, Feldman, & Zamojski, 2012; Huston & Weaver, 2008; Popovich et al., 2006; Romano et al., 2004). Several recommendations have been made within this literature.

First, it seems important that faculty independently choose to participate in the coaching relationship (Huston & Weaver, 2008; Romano et al., 2004). When faculty members choose to participate, some degree of commitment to the process may be assumed. Second, it is recommended that participating faculty members identify the topics on which they would like to focus (Edwards et al., 2014; Popovich et al., 2006; Romano et al., 2004). Providing faculty the opportunity to influence the training program helps to ensure that the program is meaningful and relevant for the participants. Third, the importance of having a dedicated, ongoing meeting time was identified by several authors (Dobbins, 2009; Haviland et al., 2010; Hixon et al., 2012). College faculty members are often managing competing demands. Without a protected time slot to engage in coaching and the work of designing new approaches to teaching, the good ideas a faculty member may identify are unlikely to be translated into action (Huston & Weaver, 2008).

There seems to be a consensus that small group training is ideal (Haviland et al., 2010; Huston & Weaver, 2008; Romano et al., 2004; Vaughan, 2004). Delivering training in small groups increases the likelihood that specific customized solutions to instructional challenges will be developed, rather than broad general recommendations that are often the outcome of large professional development sessions (Bohle Carbonell, Dailey-Hebert, & Gijsselaers 2013; Edwards et al., 2014; Haviland et al., 2010; Huston & Weaver, 2008). In addition, when coaching is provided in small groups, the opportunity for the development of a community of practice is provided. Wenger-Traynor and Wenger-Traynor (2015) define communities of practice as “groups of people who share a concern or a passion for something they do and learn how to do it better as they interact regularly” (p.1). Faculty can learn from one another, offer support to each other, and establish connections with colleagues that can

facilitate ongoing development long after the formal training opportunity has ended (Brooks, 2010; Huston & Weaver, 2008; Romano et al., 2004; Vaughan, 2004).

Communities of practice can offer a safe environment where members feel comfortable exploring new approaches to problems of practice (Margarisova, Stastna, & Stanislavska, 2010). They can help members to problem solve difficult issues, find needed information and resources, access required expertise, build arguments to support requests for change, and develop confidence with new approaches to practice (Wenger-Trayner & Wenger-Trayner, 2015). The inspiration to adopt innovative teaching practices may springboard from discussions with colleagues in a coaching group (Dobbins, 2009; Ryan, 2015), and resource sharing may facilitate adoption of new approaches with less effort than if each individual was required to develop a response to a challenge independently (Wenger-Trayner & Wenger-Trayner, 2015). Communities of practice can be a powerful vehicle for professional development and the continued evolution of pedagogical practice (Wenger, 2010)

Although the literature examined provides many helpful suggestions to consider when developing a faculty-training program, several limitations should be noted. The study by Popovich et al. (2006) collected all evaluation data at one point in time - at the end of the intervention. Given participants had invested twelve weeks in the intervention, it is possible that their responses were biased in a positive direction to allow them to justify their involvement. Similarly, Edwards et al. (2014) collected a single retrospective measure on the impact of the intervention at the end of the academic year. Collecting data at one point in time increases the probability that reflection will be less accurate as early details may be overshadowed by the more recent events. In the study reported by Romano et al. (2004), some of the findings were extrapolated from interviews with faculty members that were not recorded and transcribed for analysis. Rather, a graduate research assistant took notes during the interviews and then analysed those notes for themes. The possibility of researcher bias influencing findings is greater in this instance than if the interviews had been recorded and transcribed for analysis in their entirety. The study by Haviland et al. (2010) noted an attrition rate of 23% from the pre-intervention survey to the post-intervention survey. This raises a question about the representativeness of the data. Haviland et al. (2010) also included data from interviews conducted with a small subset of participants. These

participants were not randomly selected, so the possibility of biases influencing selection is present.

Perhaps most significantly, only one of the studies reviewed collected data based on direct observations of faculty teaching behaviours (Desselle et al., 2012). All other studies relied on self-reports collected via surveys, typically at the conclusion of the intervention. As has been noted within the literature, self-report data can be influenced by a social-desirability bias (Hixon et al., 2012). Within the study conducted by Desselle et al. (2012), faculty use of active learning strategies was assessed using a dichotomous rating scale. Observers scored the presence or absence of specific strategies during instructional sessions. No attempt was made to measure frequency of each of the strategies observed. In addition, the authors reported the reliability of their observational data as  $r = 0.78$ . While this value is reasonable, failing to present the range of agreement values occludes important details about session-by-session agreement. Hence, the evaluation of a faculty professional development program that collects direct observations of the impact of the program on observable faculty behaviour would provide a meaningful contribution to the research literature.

## 2.3 An Applied Behaviour Analytic Approach

Applied behaviour analysis (ABA) is a scientific approach to human behaviour. The applied dimension is demonstrated when principles of behaviour are applied to socially important issues, with the intent of causing meaningful change for participants (Baer, Wolf, & Risley, 1968). The behavioural dimension is typically demonstrated by focusing on what people do rather than what they say they do (Baer et al., 1968). Interventions are commonly evaluated based on data collected by directly observing participants. The analytic dimension requires practitioners and researchers alike to experimentally demonstrate that it is the independent variable they have implemented that causes behavioural change (Baer et al., 1968).

Within the ABA approach, it is assumed that behaviours are controlled by their contingencies. Said another way, things that happen before and after a behaviour influences the likelihood that the behaviour will be repeated in the future. Antecedents are the things that happen before the behaviour. Antecedents can take many forms. Some examples include: a question asked by someone, a stimulus in the environment a person attends to, a



red light while driving, or a list of instructions to follow like those included in a recipe. Consequences are the things that happen after a behaviour. Consequences can be positive, which results in the behaviour becoming more frequent in the future or negative, which results in the behaviour becoming less likely in the future. Not all consequences are easily observable. Sometimes, the things people think following a behaviour are powerful consequences that can influence future actions. In other cases, more obvious consequences may be observed. Principles of behaviour such as reinforcement, punishment, prompting, and chaining can be used to facilitate behaviour change and the learning of new skills.

ABA approaches to behaviour change have been demonstrated to be effective across a wide variety of populations and behaviours of interest. Behaviour analysts have helped typically developing children to tolerate dental exams (Allen & Wallace, 2013), adults to quit smoking (Dallery, Raiff, & Grabinski, 2013), children with autism to acquire language (Lechago, Howell, Caccavale, & Peterson, 2013), athletes to improve their performance (Stokes, Luiselli, & Reed, 2010; Stokes, Luiselli, Reed, & Fleming, 2010; Ziegler, 1987), and parents to teach abduction prevention skills to their children (Miltenberger et al., 2013). In addition, ABA approaches have been effective in training staff to implement a variety of procedures (Hine, 2014; Homlitas et al., 2014; Miller, Crosland, & Clark, 2014; Petscher & Bailey, 2006; Shayne & Miltenberger, 2013; Ward-Horner & Sturmey, 2012). To date, there is a gap in the literature involving instances of the ABA approach in faculty professional development. The possibilities of an approach to faculty training based on the conceptual framework of applied behaviour analysis will be considered in the following sections.

## 2.4 Behavioural Skills Training

Behavioural skills training (BST) procedures are one approach to teaching complex skills based on the principles of applied behaviour analysis. Generally speaking, BST procedures are used to teach skills that can be practiced by learners in a role-play situation (Miltenberger, 2016). The BST approach has been successfully used to train a variety of skills to children (Johnson et al., 2005; Nuernberger, Ringdahl, Vargo, Crumpecker, & Gunnarsson, 2013), parents (Gross et al., 2007; Miltenberger et al., 2013; Shayne & Miltenberger, 2013), and staff (Hine, 2014; Homlitas et al., 2014; Love, Carr, LeBlanc, &

Kisamore, 2013; Miller et al., 2014; Sarokoff & Sturmey, 2008; Ward-Horner & Sturmey, 2012).

BST procedures are comprised of four components: instructions, modeling, rehearsal, and feedback (Miltenberger, 2016). First, specific instructions that describe the behaviours the learner should engage in are delivered. Ideally, the instructions will only be delivered while the learner is paying attention and presented by someone who has credibility with the learner (Miltenberger, 2016). Following the instructions, the behaviours will be modeled for the learner. To the greatest extent possible, the model should demonstrate the behaviours in the context in which they will eventually be used, and the model should be reinforced when he/she demonstrates the correct behaviours. The third component of the procedure is rehearsal. Within this component, the learner will practice the skills that are being taught. By rehearsing, the trainer has the opportunity to assess whether the learner has acquired the target skills. The more similar the rehearsal context is to the actual context the behaviour is to be demonstrated, the more likely the skill will generalize to the natural situation (Miltenberger, 2016). The final component of BST is feedback. This includes delivering praise for correct performance and additional instruction following errors (Miltenberger, 2016). In this way, feedback is designed to act as a positive consequence, one that increases the likelihood that the correctly demonstrated behaviours will continue and as an antecedent, by providing additional instruction as a prompt for correct behaviour on the next opportunity (Miltenberger, 2016).

BST procedures have been effectively applied to teach a variety of skills. For example, Love et al. (2013) used a modified BST procedure to teach research methods to clinical staff within an early intervention program for children with autism. Twenty-four staff members participated in the training that was divided into eight modules. Modules 1 through 6 began with pre-tests to assess participants' baseline knowledge. Modules 7 and 8 were application based and thus did not have pre-tests associated with the content. Following the pre-tests, lectures were delivered. The lectures included demonstrations of relevant behaviours, thus including both the instruction and modeling components of BST procedures. It was not practical to have all participants complete the targeted research method skills in the natural environment; consequently, approximately one week after the lecture, participants were assigned a homework task related to the lecture material. The researchers used the

homework assignment to provide the rehearsal component of the BST procedure. The assignments were graded, and feedback that identified correct and incorrect responses was provided to each participant. Post-tests for modules 1 through 6 were given at the beginning of the next training session. The training was successful in changing participants' knowledge as demonstrated by statistically significant improvements in test scores for all six modules. Additionally, at a one-year follow-up, there was a modest increase in the number of staff who reported they were engaged in research and had presented a research project at a professional conference. It would seem that modified forms of BST can be effective in changing staff behaviour.

When considering a multi-component intervention, a researcher or clinician should question to what extent each component is necessary to obtain the desired effects. In other words, interventions should be as simple as possible. If not all of the components of an intervention are required to obtain the desired results, those non-critical components should be eliminated. One way to empirically determine which aspects of an intervention are necessary is to conduct a component analysis.

In 2012, Ward-Horner and Sturmey conducted a component analysis of a BST procedure to teach three direct-care staff working in a school how to administer a functional analysis. Staff performance was assessed during 5-minute simulated-assessment sessions, where the participant demonstrated the relevant skills while a researcher simulated child behaviour. The BST package included instructions, modeling, rehearsal, and feedback. Instructions were delivered in a written format that participants reviewed. Modeling was provided via 5-minute videos, where the participants observed the researchers role-playing the functional analysis condition being taught. Rehearsal occurred in 5-minute practice sessions, where the participant practiced the skills relevant for a given functional analysis condition with a researcher. The feedback component of the BST procedure was delivered immediately following a simulated assessment session. Skills that had been demonstrated with at least 90% accuracy were praised, while behaviours demonstrated with less accuracy were corrected. Following the delivery of verbal feedback, the participants were provided with a written summary as well. Delivering feedback was effective at changing staff behaviour 100% of the time, while modeling was effective 50% of the time. Rehearsal never resulted in staff meeting the mastery criteria for behaviour change. The authors of the study caution

against making broad generalizations on the active components of BST based on this study. However, it would seem that feedback is an important component of a BST procedure.

BST procedures have demonstrated their effectiveness at establishing behaviour change. Because of their reliance on direct-observation of participants' behaviour, the impact of the interventions is quite clear. When BST procedures are applied in a group setting, as was described in the study by Love et al. (2013), several benefits may be obtained. First, the training procedure can be more efficient, as the trainer does not have to deliver all of the instruction and modeling on an individual basis (Miltenberger, 2016). Second, participants can learn from observing one another during rehearsal and feedback sessions. Finally, reinforcement for correctly demonstrating the target behaviour may be increased by encouraging peers within the training group to praise one another for successful demonstration of the targeted skills (Miltenberger, 2016).

While the literature provides much support for BST procedures, they are not without their limitations. First, the trainer, typically a subject matter expert, determines the skills to be taught and develops the instructional materials independent of the participants. This does not allow the participants to shape the nature of the training. While this may be appropriate when teaching skills to young children, it seems less appropriate when working with adults to change a behaviour over which they have discretionary control. This approach also conflicts with the recommendation from the research literature on faculty professional development; that is, faculty shape the training content. Second, in traditional BST procedures, there is no place for the trainee to set their own personal goals related to behaviour change. Based on the literature, involving participants in goal setting is an important step in achieving buy-in for behaviour change (Eldridge & Dembkowski, 2013; Latham & Locke, 2007; Locke & Latham, 2006; Ward, 2011). College faculty members have a great deal of discretion over how they teach their courses. As such, a directive expert-driven model such as BST may not be optimally effective, especially if the professors do not see value in the skills attempting to be taught. In the following section, the literature on behavioural coaching will be considered as a means to develop a more collaborative approach to behaviour change.

## 2.5 Behavioural Coaching

The term *behavioural coaching* has been used in numerous settings to identify a wide variety of approaches to behavioural change (Seniuk, Witts, Williams, & Ghezzi, 2013). In the absence of a clear definition of the term, interventions of varying complexity and sophistication are assigned the same title. This makes replication of studies and evaluation of the efficacy of behavioural coaching as a packaged intervention challenging (Seniuk et al., 2013). An investigation of the term from both an applied behaviour analytic and broader psychological perspective will be presented for consideration in the development of a faculty-training program.

Within the field of applied behaviour analysis, behavioural coaching has its historical roots in the domains of athletic performance and organizational behaviour management (Seniuk et al., 2013). Related to sports, the key characteristics of effective behavioural coaching were outlined by Martin and Hrycaiko in 1983. Martin and Hrycaiko (1983) suggested that effective behavioural coaching was comprised of six characteristics. First, coaching should emphasize frequent, specific measurement of target behaviours. Second, effective coaching should distinguish between developing new behaviours and maintaining those behaviours once learned as different strategies are indicated to accomplish each of these goals. Third, behavioural coaching should encourage participants to measure their improvement based on their individual previous performance. Said another way, participants should not be compared to one another when evaluating the impact of a coaching intervention. In this way, behavioral coaching is individualized and tailored to meet the learner where they are related to the targeted skill. Fourth, effective behavioural coaching must make use of behavioural procedures that have empirically demonstrated effectiveness. Martin and Hrycaiko (1983) describe coaching as a science, not an art form. The science that coaching draws from in this context is applied behaviour analysis. Fifth, effective behavioural coaching should include the coach applying each of the first four characteristics to his/her own behaviour to improve efficacy. The final component identified is related to social validity. Effective behavioural coaching will ensure that the methods used and goals selected are important to those involved (Martin & Hrycaiko, 1983).

The characteristics articulated by Martin and Hrycaiko (1983) were specifically related to behavioural coaching applied to athletic performance; however, Seniuk et al. (2013) suggest that these characteristics can be used to identify behavioural coaching when it is applied in other contexts. When contrasting the description of behavioural coaching with that of BST procedures, the former has more breadth. Specifically, the description of behavioural coaching draws attention to coach behaviour and the social validity of the procedures and the outcomes. Neither of these components are explicitly identified in the description of BST procedures, although it should be noted that social validity data is often collected when BST procedures are used (Love et al., 2013; Miltenberger et al., 2013; Ward-Horner & Sturmey, 2012).

The description of BST procedures provided by Miltenberger (2016) and the description of the components of effective behavioural coaching provided by Martin and Hrycaiko (1983) converge in one significant way. The components of BST (i.e., instructions, modeling, rehearsal, and feedback) are commonly included in behavioural coaching. A 2004 review of the previous 30 years of single-subject designs in sport psychology found that intervention components varied greatly across the 40 behavioural coaching studies that met inclusion criteria (Martin et al., 2004). Despite this variation, instructions, rehearsal, modeling, and feedback were commonly indicated as intervention components, although rarely were all implemented within a single study (Martin et al., 2004). The most common intervention procedure used was goal setting, indicated in 11 of the 40 studies reviewed (Martin et al., 2004). It would seem that the incorporation of goal setting warrants deliberate consideration when developing a coaching program designed to effect behavioural change.

The organizational behaviour management approach to behavioural coaching is less well defined than the approach described related to athletic performance. Seniuk et al. (2013) note that consultants frequently use the term but that there is a dearth of research available within the scientific literature. Eldridge and Dembkowski (2013), working from a broader psychological perspective, echo this concern. Specifically they note that much of the research that attempts to evaluate the efficacy of coaching is not explicit about the methodology used (Eldridge & Dembkowski, 2013). Despite this limitation, Eldridge and Dembkowski (2013) note that the core of most coaching programs is grounded in a

behavioural approach to change; they provide a review of common components of behavioural coaching approaches.

First, Eldridge and Dembkowski (2013) indicate that stimulus control, a behavioural principle, is a key component of behavioural coaching. They suggest that by analyzing the environment, the coach and learner can determine how antecedent events may be altered to effect behavioural change. Second, they identify that feedback is a common component of behavioural coaching. It is noted that feedback can take many different forms, and it must be individualized in order to be effective. The third component they identify is modeling. Within behavioural coaching, the model may be the coach but may also be someone else within the organization that the participant is encouraged to observe. Eldridge and Dembkowski (2013) state that the model can also be symbolic, contacted by the participant indirectly through video or books. The fourth component identified is rehearsal. Rehearsal may take place with the coach or in the natural environment. Eldridge and Dembkowski (2013) suggest that the learner can be encouraged to reflect on the impact of his/her practiced skills. By engaging in self-monitoring, the learner is able to adjust his/her practice on an ongoing basis until the desired outcome is achieved. The final common component of behavioural coaching identified is goal setting. Eldridge and Dembkowski (2013) state that the learner should set specific, measurable, achievable goals for his/her performance.

The description of behavioural coaching provided by Eldridge and Dembkowski (2013) has considerable overlap with that of BST provided by Miltenberger (2016). While instructions are not explicitly stated as a component of behavioural coaching by Eldridge and Dembkowski (2013), the activities that are described in assessing stimulus control would lead to instruction. What may differ is who develops the instructions. The model described by Eldridge and Dembkowski (2013) suggests a more collaborative approach to problem identification and action planning. Modeling is noted in both procedures, although the description of how modeling is used varies somewhat between the two. Rehearsal is identified as a component in both procedures as well, but again, with slightly different intentions. Within the behavioural coaching model, rehearsal may include practice of the skill in the natural environment where the skill is to be demonstrated. Within the BST model, rehearsal is associated with practicing of skills, not actual demonstration in the natural environment. Feedback delivered as reinforcement for correct performance and

further instruction in the case of errors is indicated as an important component in both models. The inclusion of goal setting in the description from Eldridge and Dembkowski (2013) is the only significant point of divergence between the two. This is a critical component, absent from BST procedures and the description of behavioural coaching provided by Martin and Hrycaiko (1983).

Goal setting theory as described by Latham and Locke (2007) states that there is a “positive linear relationship between a specific high goal and task performance” (p. 291). Said another way, when individuals set challenging but attainable goals, their performance improves. This finding has been replicated in laboratory, simulated, and organizational settings, regardless of whether goals were set by individuals, assigned by others, or set jointly (Latham & Locke, 2007; Locke & Latham, 2006). It is important that the goal set be achievable within the time frame targeted (Ward, 2011). If the goal is too difficult, frustration rather than motivation may be the result. In the case of a complex task, where the end performance goal is distant from current performance levels, the setting of intermediate goals may be advised (Ward, 2011).

When a specific behavioural goal is set, an individual’s attention, effort, and action can be more purposefully directed towards goal-relevant behaviours (Locke & Latham, 2006). This can be particularly helpful for individuals who have competing demands on their time. Setting a goal creates a priority, which may lead to more effective behaviour change. Setting, and then achieving goals, can also increase job satisfaction, but only when the individual reports that the goal was difficult to attain (Latham & Locke, 2007). In addition, when a goal is described as something an individual can learn to do well, performance is higher than when the goal is framed negatively as something that will be difficult to master (Latham & Locke, 2007; Locke & Latham, 2006). This has important implications for the way in which behavioural goals are discussed and set within a training group. Based on the research literature, it would seem wise to ensure that conversations about goals are positive in nature, encouraging those setting the goals of their ability to achieve the targets they determine.

Goals are more effective when they are combined with performance feedback (Latham & Locke, 2007; Locke & Latham, 2006; Ward, 2011). Performance feedback can take many



forms, including discussions about performance and the review of graphic displays of performance. There is some research to support the importance of making an individually set goal public (Hayes et al., 1985). The study by Hayes et al. (1985) investigated the impact of public versus private goal setting compared to a control condition where no goals were set on the studying behaviour of college students. They found that when participants set a goal and stated it aloud within their treatment group, they were far more likely to achieve their goal than when they set a private goal. In fact, there was no difference in performance between the private goal setting group and the control group who did not set specific study goals of any kind. Considering the outcome of this study, there may be benefit to having participants state their personal performance goals aloud during training sessions. Hayes et al. (1985) describe this effect as a form of social standard setting. Because most people have a long history of being reinforced when they do what they say they will do, publicly stating goals may increase the likelihood that they will be attained. Finally, when an individual determines their own performance goals, motivation increases as autonomy and ownership are enhanced (Ryan & Deci, 2000). This provides support for the utility of individuals setting their own performance improvement goals rather than having goals set by a trainer.

The description of behavioural coaching provided by Eldridge and Dembkowski (2013) recommends a collaborative approach to behaviour change where the coach and the learner work together to effect behaviour change. This is a good match to the type of intervention suggested from the faculty professional development literature. However, the absence of empirical data to evaluate the efficacy of behavioural coaching outside of the realm of athletic performance is a significant limitation. The empirical evaluation of an intervention where participants work collaboratively with a coach, setting their own performance improvement goals, could make a meaningful contribution to the research literature. The table below highlights key intervention components, synthesized from the research literature reviewed.

**Table 1- Key Intervention Components**

| Intervention Component | Empirical Support                          |
|------------------------|--|
| Faculty self-nominate  | Huston & Weaver, 2008; Romano et al., 2004 |

|   |   |
|---|---|
| Faculty influence curriculum  | Edwards et al., 2014; Popovich, et al., 2006; Romano et al., 2004   |
| Small groups  | Bohle Carbonell, et al., 2013; Brooks, 2010; Dobbins, 2009; Edwards et al., 2014; Haviland et al., 2010; Huston & Weaver, 2008; Love, et al., 2013; Margarisova, et al., 2010; Romano et al., 2004; Vaughan, 2004 |
| Faculty set individual performance goals  | Eldridge & Dembkowski, 2013; Latham & Locke, 2007; Locke & Latham, 2006; Ward, 2011   |
| Faculty publicly state performance goals  | Hayes, et al., 1985   |
| Inclusion of instruction, modeling, rehearsal and feedback based on Behavioural Skills Training (BST) procedures. | Homlitas et al., 2014; Love et al., 2013; Miltenberger, 2016; Ward-Horner & Sturmey, 2012   |
| Faculty work collaboratively with a coach   | Eldridge & Dembkowski, 2013; Popovich, et al., 2006; Romano et al. 2004   |

## 2.6 Purpose of the Present Study

College faculty face increased pressure to incorporate technology into their teaching practice (Edwards et al., 2014; Garrison & Kanuka, 2004). College presidents identify professional development related to technology as a high priority, while also acknowledging shrinking budgets to support ongoing faculty development (Wallin, 2003). Numerous authors highlight the importance of linking technology enhancements to sound pedagogical approaches (Bohle Carbonell et al., 2013; Edwards et al., 2014; Garrison & Kanuka, 2004; Poirier & Feldman, 2012). It is not sufficient to simply add-on technology to existing course materials. Significant consideration must be given as to how the use of technology can enhance learning. Supporting faculty with professional development to complete this task is essential for success.

To date, researchers have explored various approaches to faculty professional development, some of which have been related to the adoption of technology-enhanced teaching. A

common limitation to these studies has been their reliance on self-report and delayed reflection to evaluate outcomes. Based on the success of BST procedures in staff training (Fetherston, 2012; Homlitas et al., 2014; Love et al., 2013; Miller et al., 2014) and the value of individual goal setting and collaboration identified in the faculty professional development and behavioural coaching literature, the purpose of this study is to evaluate the effect of a behavioural coaching intervention on faculty adoption of technology-enhanced teaching practices.

The study will invite a small group (n=6) of college professors to participate in weekly coaching sessions designed to support their adoption of technology-enhanced teaching practices. The study will consist of three experimental phases: baseline, training, and maintenance. In all three phases, participants' teaching will be observed. The weekly rate of technology-enhanced teaching practices will be recorded for each participant. For the purposes of this study, a technology-enhanced teaching practice (TETP) is defined as follows:

*An activity or instruction presented by the instructor that requires the student to do something using technology as one of their tools. Exclusionary criteria include demonstrating computer software or modeling how to navigate course websites or college directory files.*

During the baseline phase, weekly coaching sessions will address participant identified barriers to implementing technology-enhanced teaching.

During the training phase, weekly coaching sessions will incorporate instructions, modeling, rehearsal, feedback, and goal setting. Sessions will follow a predictable format. First, participants will share their reflections on the successes and challenges faced during the previous teaching week. Individual performance data will be reviewed and personal performance goals adjusted as appropriate. Feedback based on performance will be provided. Next, two to three technology-enhanced teaching practices grouped around an area of interest identified through a needs assessment will be demonstrated in a classroom simulation activity. The simulation will provide a model to the participants of how an instructor might implement specific TETPs, and participants will take on the role of students during the activity. Following the simulation, the researcher will provide instruction by way

of explaining the techniques demonstrated. Participants will be given a Technology-Enhanced Teaching Practice Behaviour Checklist form (Appendix 1) for each practice demonstrated. The form will list all of the tasks required to design and implement the specific TETP. Finally, participants will confirm and publicly state their performance goal for the upcoming week and create their lesson plan(s) using the TETP Checklist form appropriate to the practice(s) they have chosen.

During the maintenance phase, classroom simulation activities will cease. Meeting times will be devoted to lesson plan development and problem solving.

Specifically, this study seeks to answer the following questions: (1) Does the training intervention result in participants adopting technology-enhanced teaching practices? (2) Does their rate of adoption correspond with their self-selected goals? and (3) Are participants satisfied with the coaching experience?

## Chapter 3

### 3 Method

#### 3.1 Participants

Six participants were recruited from the full-time faculty population at a small to mid-sized community college in Ontario, Canada. All participants self-nominated to participate in the study and were teaching in a program in which students were required to bring a mobile device with them to the classroom. Demographic information about participants was collected as part of a needs assessment (Appendix 2) conducted at the outset of the study. See Table 2 for the results of the demographic information as reported by the participants at the beginning of the study.

**Table 2- Demographic Information**

|  | Mean (years)           | Range (years)        |
|--|------------------------|----------------------|
| Duration of Full-Time Teaching Experience        | 13.4                   | .5-28                |
| Duration of Part-Time Teaching Experience        | 4.4                    | 0-12                 |
|  | Number of Participants | Percentage of Sample |
| School Affiliation                               |                        |                      |
| Business and Creative Design                     | 2                      | 33%                  |
| Community Services and Liberal Studies           | 2                      | 33%                  |
| Health Sciences, English, and Humanities         | 2                      | 33%                  |
| Number of Semesters Teaching in a Mobile Program |                        |                      |
| Zero   | 3                      | 50%                  |
| Two  | 3                      | 50%                  |
| Mobile Device Selected for Program               |                        |                      |
| iPad   | 2                      | 33%                  |
| Laptop   | 1                      | 17%                  |
| Unspecified                                      | 3                      | 50%                  |
| Average Class Size                               |                        |                      |
| 21-35  | 1                      | 17%                  |
| 36-50  | 3                      | 30%                  |
| 51+  | 2                      | 33%                  |

#### 3.2 Setting and Materials

Pre-intervention and weekly group coaching sessions were held in various college meeting rooms. Teaching occurred in classrooms regularly assigned to participants. A stationary

video camera mounted to a tripod was used to record 32% of participant teaching sessions across all conditions and participants. The camera was positioned to capture the podium area of the classroom and the large projection screen. The camera was turned on by the researcher before the participant began instruction and turned off after the participant dismissed the students for the day. In addition, prior to each weekly coaching session, the researcher placed a video camera on a tripod in one corner of the room. She aimed the camera so that it would capture all participants and the podium and large presentation screen. The researcher turned the camera on before the session began and turned it off at the end of each coaching session.

### 3.3 Measure

#### 3.3.1 Technology-Enhanced Teaching Practice (TETP)

The dependent variable measured was the frequency of technology-enhanced teaching practices implemented per week. For the purposes of this study, a technology-enhanced teaching practice was defined as follows:

*An activity or instruction presented by the instructor that requires the student to do something using technology as one of their tools. Exclusionary criteria include demonstrating computer software or modeling how to navigate course websites or college directory files.*

For example, an instructor who delivered a lecture while projecting PowerPoint slides would not be implementing a technology-enhanced teaching practice. In contrast, an instructor who presented discussion questions to the class and then required students indicate their response via a polling application would be implementing a technology-enhanced teaching practice. Taking one more set of examples, an instructor showing a video from YouTube to his/her class would not be implementing a technology-enhanced teaching practice. However, if the instructor tasked students to find video exemplars of a concept discussed in class and the students shared those videos with one another, a technology-enhanced teaching practice would be demonstrated. One TETP could be comprised of a single or several student responses. A TETP ended when the instructor resumed lecture-style instruction or moved onto another activity that may or may not have used technology.

## 3.4 Experimental Design

A changing criterion design (Kazdin, 2011) was used to evaluate the effects of the behavioural coaching intervention on faculty adoption of technology-enhanced teaching practices. The changing criterion design is a single-case research design. The use of a single-case research design allows for the rigorous evaluation of an intervention with a small number of participants (Barker, Mellalieu, McCarthy, Jones, & Moran, 2013). Data was collected and analyzed on an ongoing basis. The researcher visually inspected graphs for each participant, analyzing the data for changes in level, trend, variability, immediacy of effect, and overlap.

Within the changing criterion design, each participant acts as his/her own control (Kazdin, 2011). The changing criterion design is most appropriate when behaviour needs to be shaped (Kazdin, 2011). Said another way, when the end goal is distant from current performance levels, and intermediate steps are required in order to reach the terminal goal, a changing criterion design is appropriate. Within this study, participants set weekly performance goals. The strength of the experimental design is shown if behaviour changes consistent with changes in the criterion levels, or in this case, personal goals set.

For some participants, a brief reversal phase was included to strengthen the demonstration of experimental control. This study was not intended to be a large, between groups comparison of two different training techniques. Rather, the goal of this study was to determine if a behavioural coaching intervention was effective in causing behaviour change for this group of participants.

## 3.5 Procedure

### 3.5.1 Pre-Intervention

#### 3.5.1.1 Initial Meeting

An initial meeting was held with four of the study participants to obtain informed consent to participate and further describe the purpose of the study. Participants were informed of the anticipated time commitment of 2 hours each week, and the operational definition of a

technology-enhanced teaching practice was discussed. A needs assessment was conducted to determine participant interest in various technology-enhanced teaching practices linked to different types of learning outcomes (Appendix 2). Participants identified barriers that they believed would inhibit their successful incorporation of technology-enhanced teaching practices. The barriers were recorded and retained for discussion in the intervention phase of the study. Two participants were unable to attend the group meeting. These participants were oriented to the study in one-to-one meetings where the details of the study were described, informed consent to participate was obtained, and the needs assessment was implemented.

### **3.5.1.2 Curriculum Development**

Brief 30-45 minute classroom simulations were developed matched to participants' interests as indicated by the needs assessment. The simulations demonstrated two to three technology-enhanced teaching practices linked to specific types of learning outcomes. For example, one simulation made use of a concept mapping application to demonstrate how creating a visual representation of a concept could enhance understanding of course material. To accompany the simulations, a TETP Behaviour Checklist form (Appendix 1) was created for each teaching practice demonstrated. The form listed all of the tasks required to design and implement the specific TETP.

### **3.5.2 Baseline**

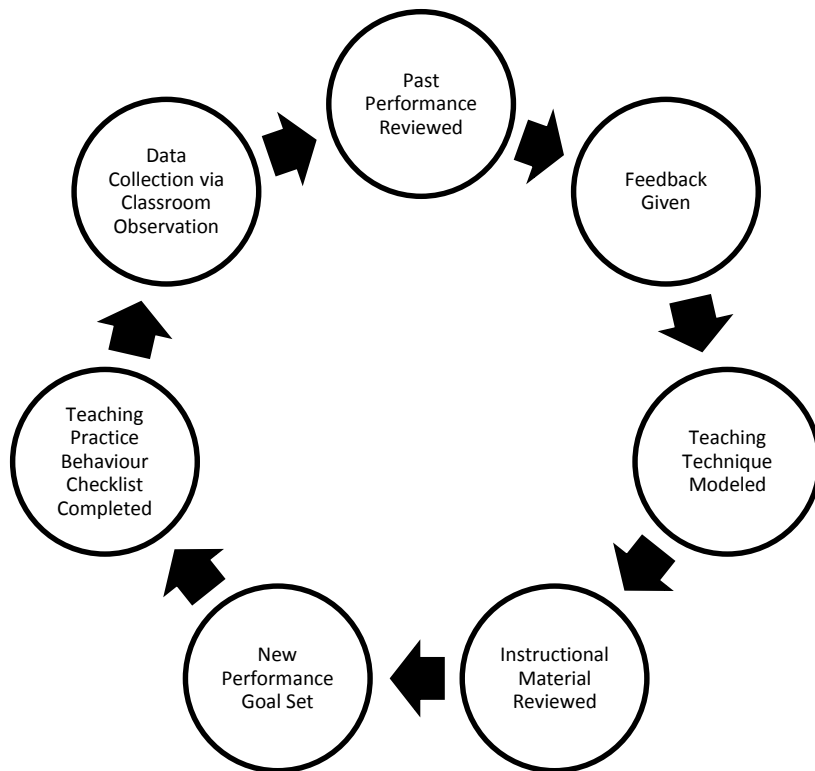
The frequency of technology-enhanced teaching practices implemented per instructional session was collected for each participant. The baseline phase was limited to one or two weeks as a result of institutional expectations that participants be incorporating technology into their teaching practice. The weekly coaching sessions confirmed that the needs analysis results remained current and a match to participant interests. Participant identified barriers to TETP were discussed with the intent of discovering solutions to commonly cited challenges. In addition, the TETP Behaviour Checklist was introduced as the tool participants would use to create concrete implementation plans related to the teaching practices they would experience throughout the study. Emphasis was placed on linking activities to desired learning outcomes, firmly connecting the technological aspects of the activities to



pedagogical goals in the classroom. Participants also reviewed their own baseline data and set a performance goal for the following week.

### 3.5.3 Training

Weekly coaching sessions consisted of a modified BST procedure, including goal setting, feedback, modeling, instructions, and rehearsal. All intervention tasks were completed during a 2-hour meeting and participants were encouraged to share ideas with one another in an attempt to develop a community of practice. Training sessions continued for ten weeks. The figure below depicts the weekly cycle of activities



**Figure 1- Weekly Coaching Session Cycle**

#### 3.5.3.1 Goal Setting

Researchers have found that when individuals set challenging, yet attainable goals, and state them publicly, they are more likely to meet those goals (Hayes et al., 1985; Latham & Locke, 2007; Locke & Latham, 2006). Based on these findings, on a weekly basis participants

reviewed their performance data and set a personal performance goal for the following week. Once set, the participants shared their goal with the training group. The experimenter encouraged participants to set challenging, yet achievable goals. Once a participant reliably achieved a goal, he/she was encouraged to set a higher goal for the subsequent week.

#### **3.5.3.2 Performance Feedback**

Performance feedback is a key component of BST procedures (Sarokoff & Sturmey, 2008; Ward-Horner & Sturmey, 2012). Differential feedback was given based on whether the participant met his/her self-selected goal for the week. If the goal was met, praise and encouragement were provided. If the goal was not met, barriers to achieving the goal were discussed, with a plan developed to address those barriers identified. In addition, during observation sessions, the researcher provided praise and encouragement for successful attempts at implementing technology-enhanced teaching practices, while offering suggestions and prompts if unsuccessful attempts were observed.

#### **3.5.3.3 Modeling**

Based on a component analysis of BST procedures, modeling may be a critical component to effective training (Ward-Horner & Sturmey, 2012). The researcher modeled technology-enhanced teaching practices during weekly simulation activities. The simulation provided a model to the participants of how an instructor might implement specific TETPs.

#### **3.5.3.4 Instructions**

Following the simulation activities, the experimenter provided instruction by way of explaining the techniques demonstrated. Participants were given access to a TETP Behaviour Checklist form for each practice demonstrated. Thus, instructions were provided to participants in two ways, verbally and in written form. Providing instruction is cited as an important component of BST and behavioural coaching procedures, hence its inclusion in this research study (Dib & Sturmey, 2007; Eldridge & Dembkowski, 2013; Johnson et al., 2005; Martin & Hrycaiko, 1983)

#### 3.5.3.5 Rehearsal

Participants started, and in some cases completed, a Technology-Enhanced Teaching Practice Behaviour Checklist for each targeted teaching period during the weekly training session. In a similar manner to Love et al. (2013), completion of this written rehearsal task substituted for role-playing that is typically conducted in BST procedures. It was hypothesized that by completing the majority of planning tasks within the weekly coaching sessions, participants would have more success achieving their implementation goals.

#### 3.5.4 Maintenance

For the final two weeks of the semester, the researcher provided no simulations. Instead, participants met, discussed their successes and challenges in the preceding week, and engaged in lesson planning using the previously provided TETP Behaviour Checklists as a guide. The purpose of this phase of the intervention was to slowly withdraw lesson planning support and determine if any observed changes would persist over time.

### 3.6 Data Collection

In all three experimental phases of the study, the researcher observed each scheduled class period in which instruction was planned. The researcher positioned herself in an unobtrusive location in the classroom. Observation occurred for the entire class period. Any TETPs observed meeting the study definition were scored on the study data sheet (Appendix 3), collected using an iPad. At the end of the week, the frequency of technology-enhanced teaching practices was graphed for each participant. These graphs were emailed to participants for their review in advance of the next coaching session meeting. At the end of the study, participants were provided with a list detailing each technology-enhanced teaching practice observed by the researcher over the course of the intervention. Participants were asked to indicate which of those practices were novel. From this data, a cumulative new practices graph was created and shared with participants. In 32% of observation sessions, a video camera recorded the class period to allow for interobserver agreement assessment.

### 3.7 Interobserver Agreement

Classroom observations were completed in all three experimental phases of the study by the primary researcher. Interobserver agreement (IOA) was measured by assessing video recordings in 32% of all sessions across baseline, training, and maintenance conditions across all participants. An undergraduate research assistant was trained to use the study data sheet (Appendix 3) by viewing four video recorded classroom sessions prepared by the researcher. Any instances of technology-enhanced teaching practices meeting the study definition were scored on the data sheet. Interobserver agreement (IOA) was computed by dividing the smaller number of technology-enhanced teaching practices observed by the larger number observed, multiplied by 100. IOA during training sessions averaged 100%.

### 3.8 Pre-Post Retrospective Survey, and Treatment Acceptability Measure

At the conclusion of the study, each participant was asked to complete an anonymous questionnaire (Appendix 4) to assess the impact and acceptability of the training program. Questions related to the impact of the training were assessed with retrospective pre-post questions. Questions related to treatment acceptability included a combination of rating scale responses and open-ended responses.

## Chapter 4

### 4 Results

#### 4.1 Interobserver Agreement

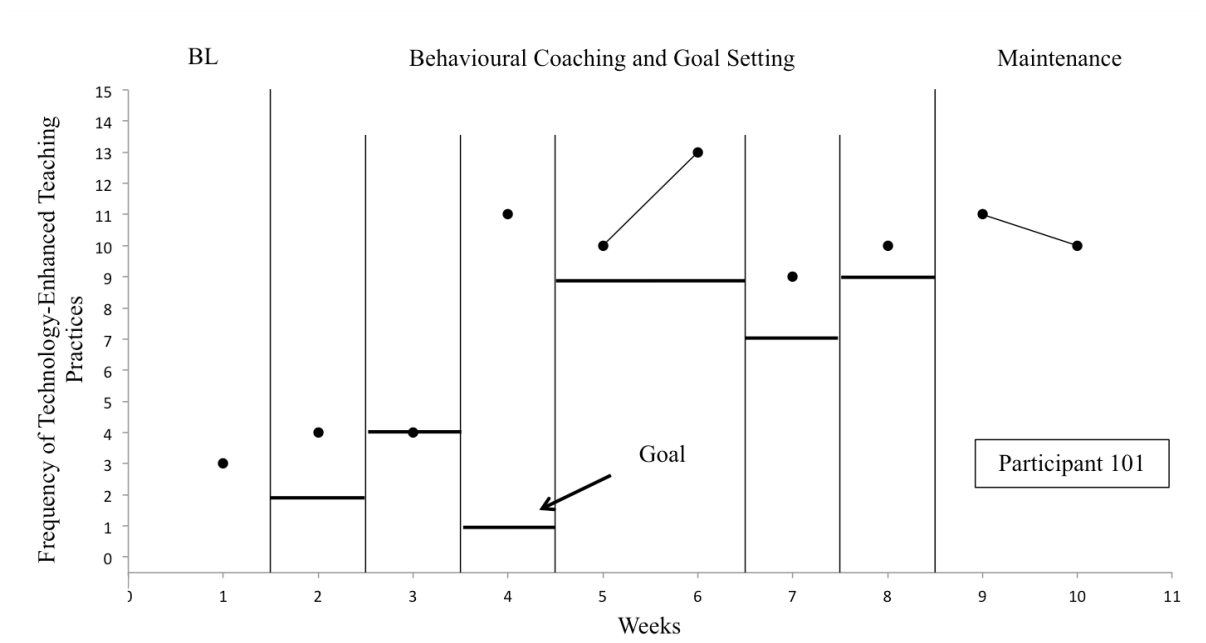
Interobserver agreement was measured in 32% of all sessions across baseline, training, and maintenance conditions. A trained undergraduate research assistant viewed recorded teaching sessions. Agreement was calculated by dividing the smaller number of TETPs observed by the larger number of TETPs observed per session multiplied by 100. During baseline, interobserver agreement averaged 87.5% (range = 50% - 100%). During training, interobserver agreement averaged 98.2% (range = 87.5% - 100%). During maintenance, interobserver agreement averaged 84.8% (range = 54.5% - 100%). Across all three phases of the study interobserver agreement averaged 95.4% (range = 50% - 100%).

#### 4.2 Frequency of Technology-Enhanced Teaching Practices

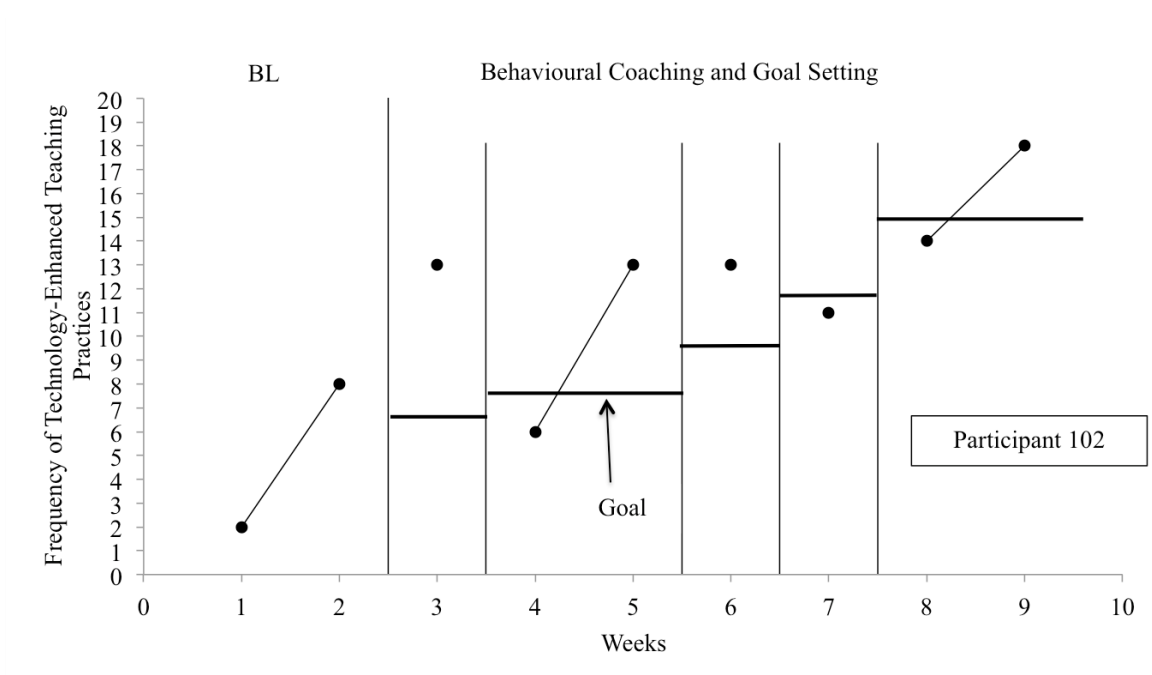
Frequency of technology-enhanced teaching practices per week across intervention phases and participants are depicted in Figures 2 through 7. During the baseline phase, most participants demonstrated few TETP's. More specifically, participant 101 demonstrated two TETP's during the baseline observation. Participant 102 demonstrated two TETP's during the first baseline observation and eight TETP's during the second baseline observation. Participant 103 demonstrated zero TETP's in both of the initial baseline observations conducted and during a return to baseline condition implemented following five weeks of training. Participant 104 demonstrated zero TETP's in the first baseline observation and one TETP in the second baseline observation. In a return to baseline condition implemented following six weeks of training, participant 104 demonstrated zero TETP's. Participant 105 demonstrated two TETP's during the initial baseline observation and one TETP during the return to baseline condition implemented following four weeks of training. Finally, participant 106 demonstrated zero TETP's in the initial baseline observation and one TETP during the return to baseline condition conducted following five weeks of training.

With the onset of the training phase, the frequency of TETP's demonstrated immediately increased for all participants. As can be seen in Figure 2, for participant 101 there was no overlap in the data from baseline throughout the training phase. In all but one session, participant 101 exceeded the publicly stated goal. Participant 101's performance remained high throughout the training period. Participant 102 set ambitious performance targets, exceeding those targets 57% of the time and failing to meet them 43% of the time. Over the course of the intervention, the frequency of TETP's implemented by participant 102 was on an increasing trend as can be seen in Figure 3. Participant 103 met (57%) or exceeded (43%) the publicly stated performance goal each week and demonstrated increased frequencies of TETP's as the training progressed. Figure 4 shows no overlap in participant 103's data across the baseline and training phase. Participant 104 set stable weekly performance targets, meeting those targets 63% of the time, exceeding those targets 12% of the time, and failing to meet those targets 25% of the time. Over the course of the intervention, the frequency of TETP's implemented by participant 104 was stable at an increased level from baseline. This pattern is depicted in Figure 5. For participant 105, there was no overlap in the data across the baseline and training phase. Participant 105 met (40%) or exceeded (60%) the publicly stated performance goal each week as can be seen in Figure 6. Finally, the data for participant 106 showed no overlap across the baseline and training phases. Participant 106 was successful in meeting (88%) or exceeding (12%) all of the publicly stated performance goals set during the training phase. Figure 7 shows that over the course of the intervention, the frequency of TETP's implemented by participant 106 was on an increasing trend.

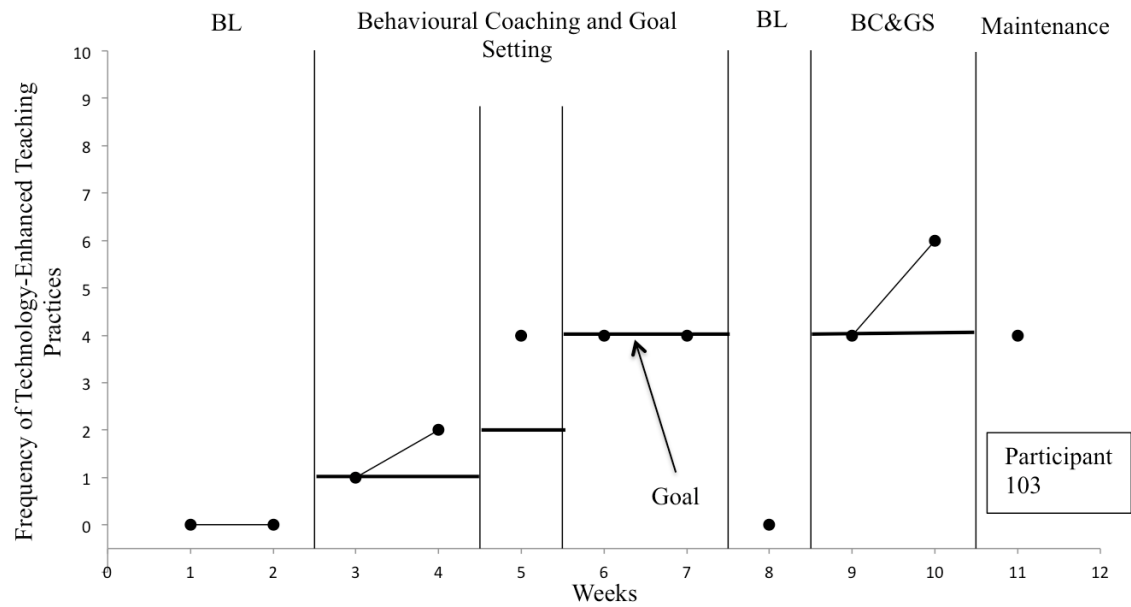
Maintenance data were collected for five participants. Participant 102 was ill for the final classes in the semester, hence maintenance data could not be collected. For all participants, performance was maintained above baseline levels during the maintenance phase.



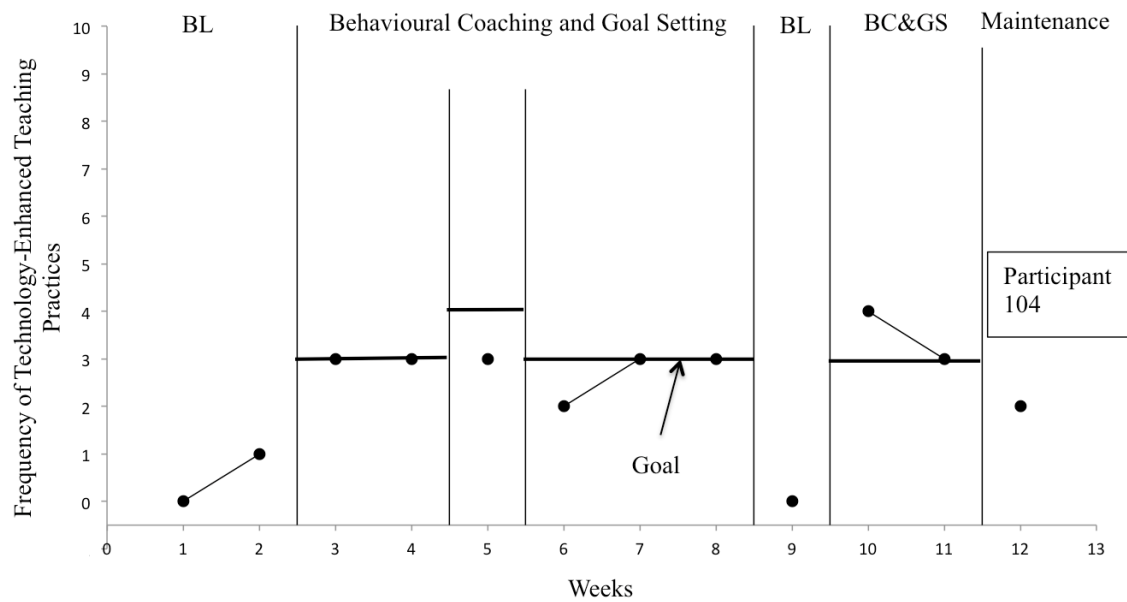
**Figure 2- Frequency of TETP's for Participant 101**



**Figure 3- Frequency of TETP's for Participant 102**

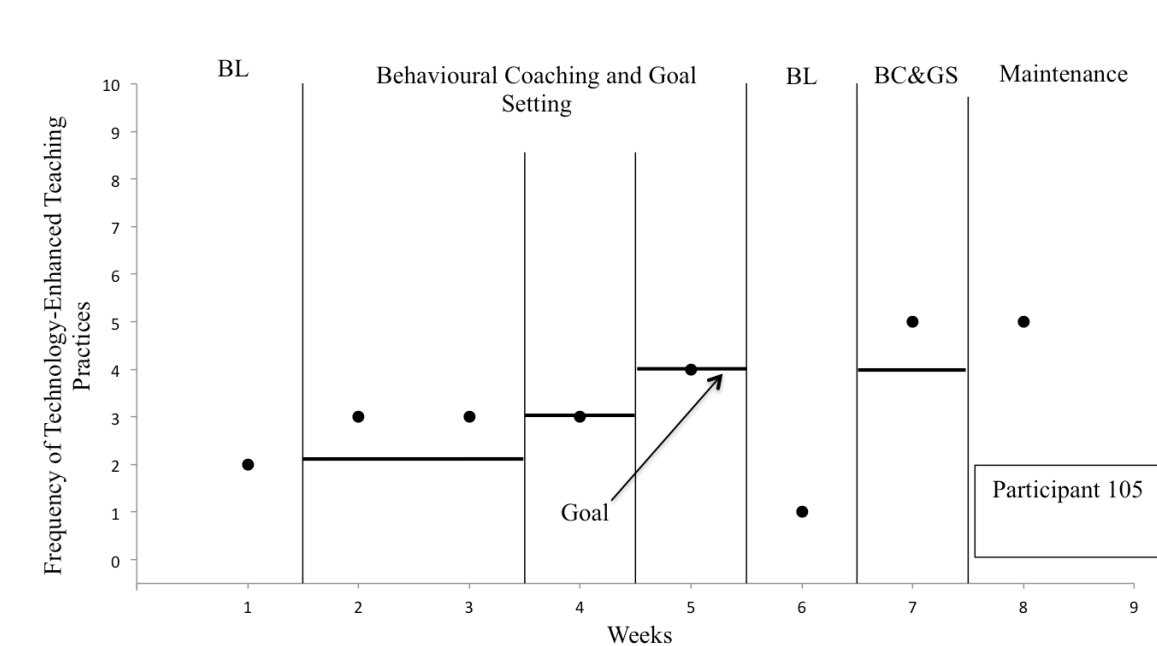


**Figure 4- Frequency of TETP's for Participant 103**

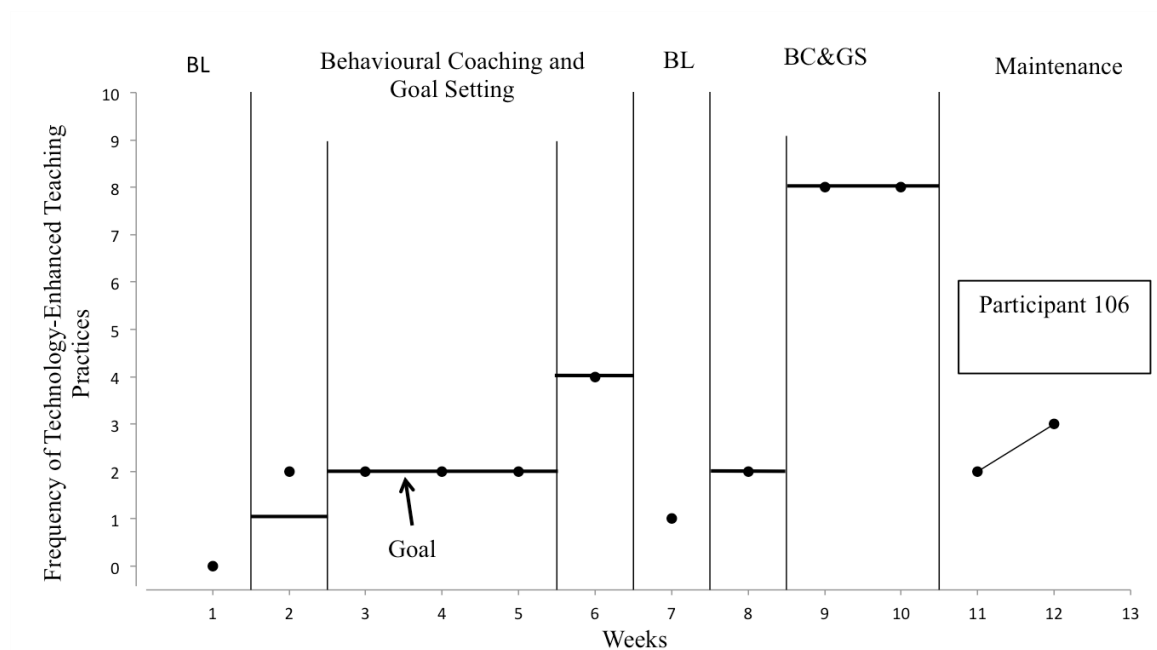


**Figure 5- Frequency of TETP's for Participant 104**





**Figure 6- Frequency of TETP's for Participant 105**

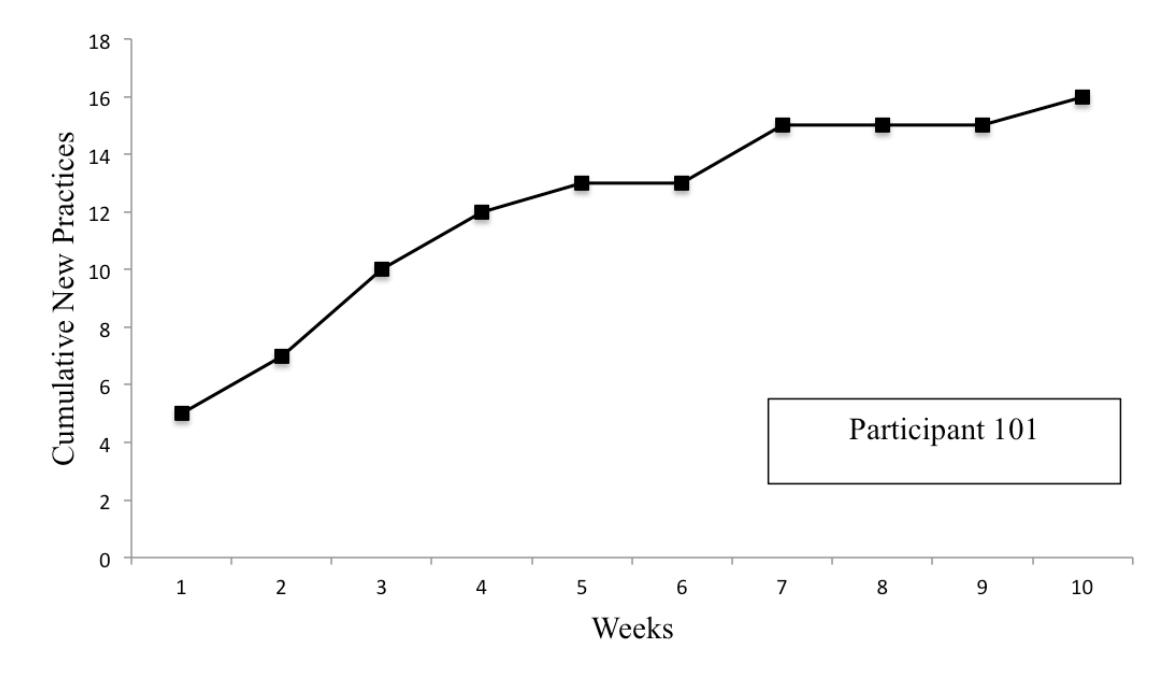


**Figure 7- Frequency of TETP's for Participant 106**

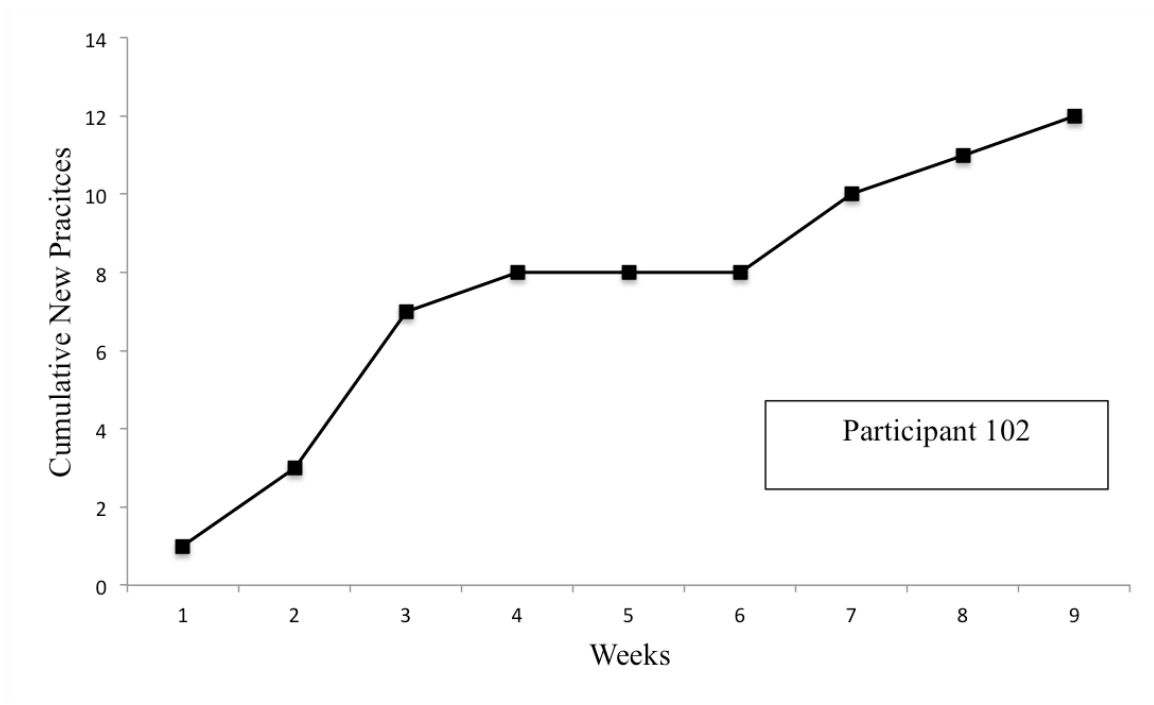
### 4.3 Cumulative New Practices

Over the course of the study, all participants adopted new technology-enhanced teaching practices. The cumulative new practices implemented across participants are displayed in

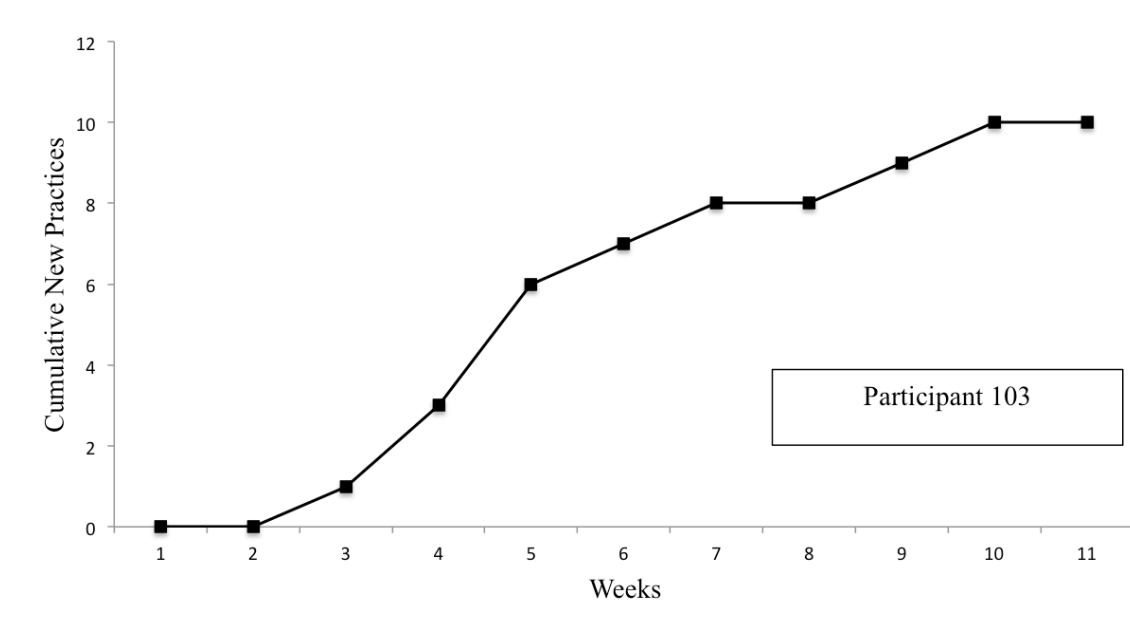
Figures 8 through 13. The data presented in these figures does not have direct correspondence with Figures 2-7. A TETP captured in the previous figures could represent a learning activity that included multiple practices reported in these figures. Three participants (103, 104, 106) entered the study having no experience incorporating TETP's within their classrooms. On average, those participants incorporated nine new TETP's into their classes (range = 3-14). Three participants (101, 102, 105) had prior experience incorporating TETP's within their classrooms. Over the course of the study they implemented on average 14 new TETP's in their classes (range = 12-16). A cumulative list of new TETP's adopted across participants is displayed in Table 3.



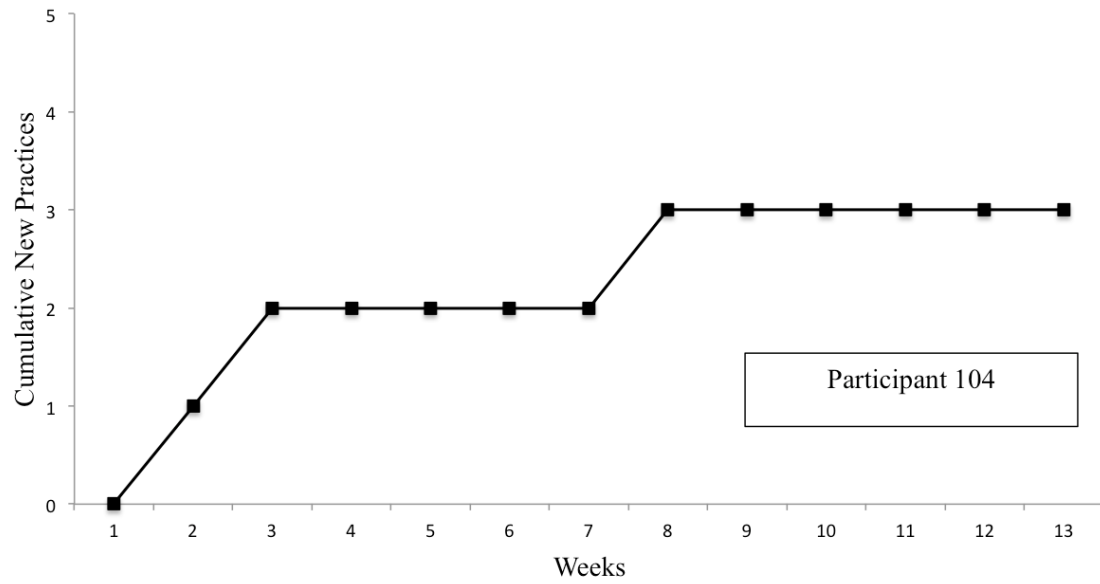
**Figure 8- Cumulative New Practices Throughout the Study for Participant 101**



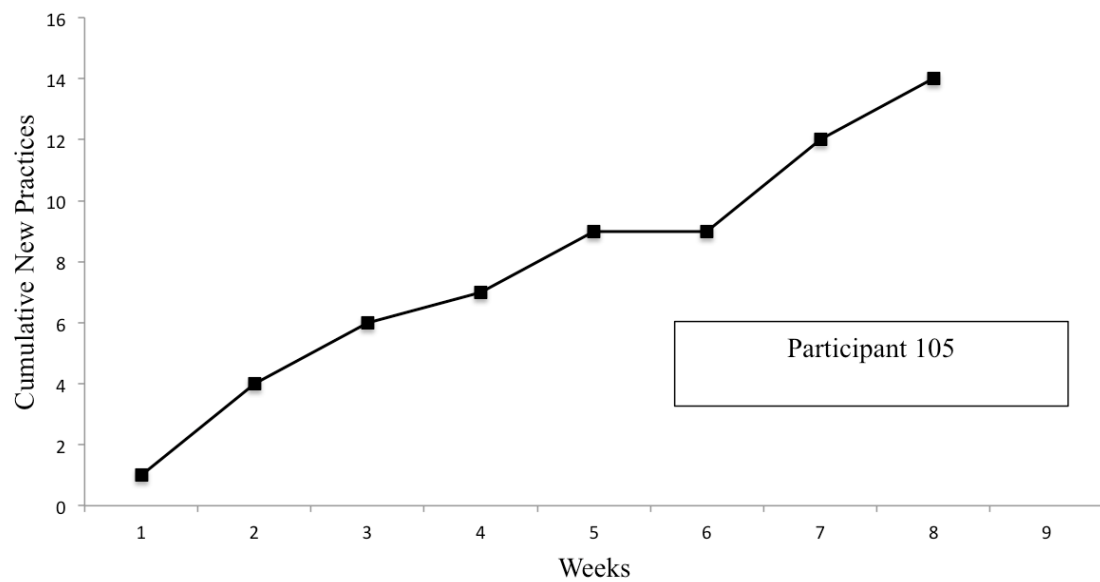
**Figure 9- Cumulative New Practices Throughout the Study for Participant 102**



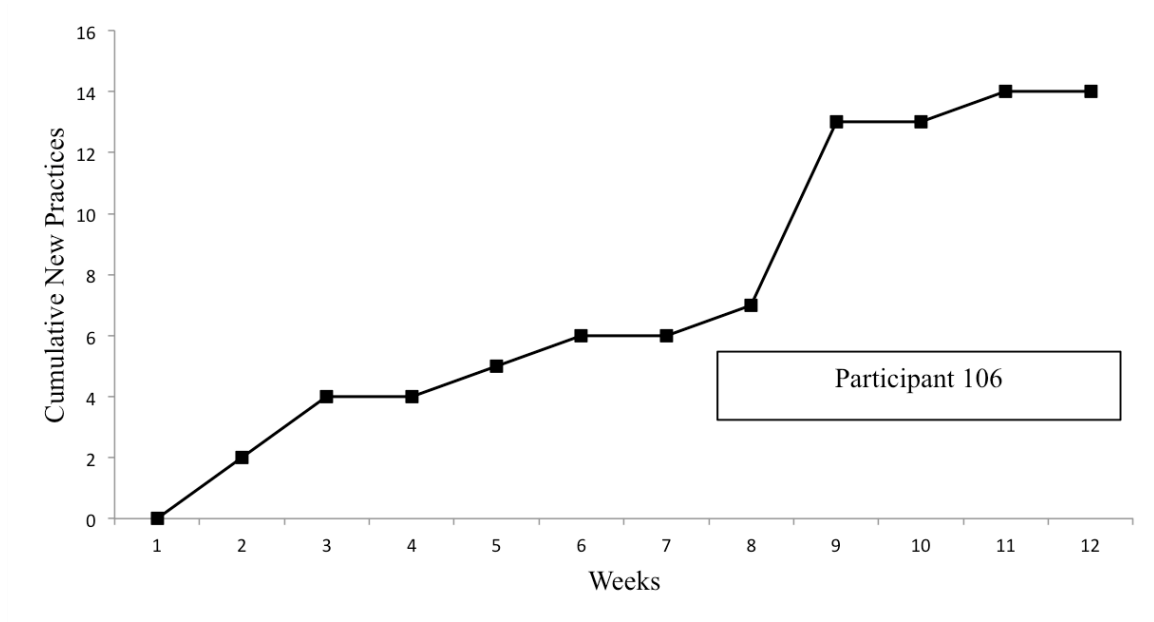
**Figure 10- Cumulative New Practices Throughout the Study for Participant 103**



**Figure 11- Cumulative New Practices Throughout the Study for Participant 104**



**Figure 12- Cumulative New Practices Throughout the Study for Participant 105**



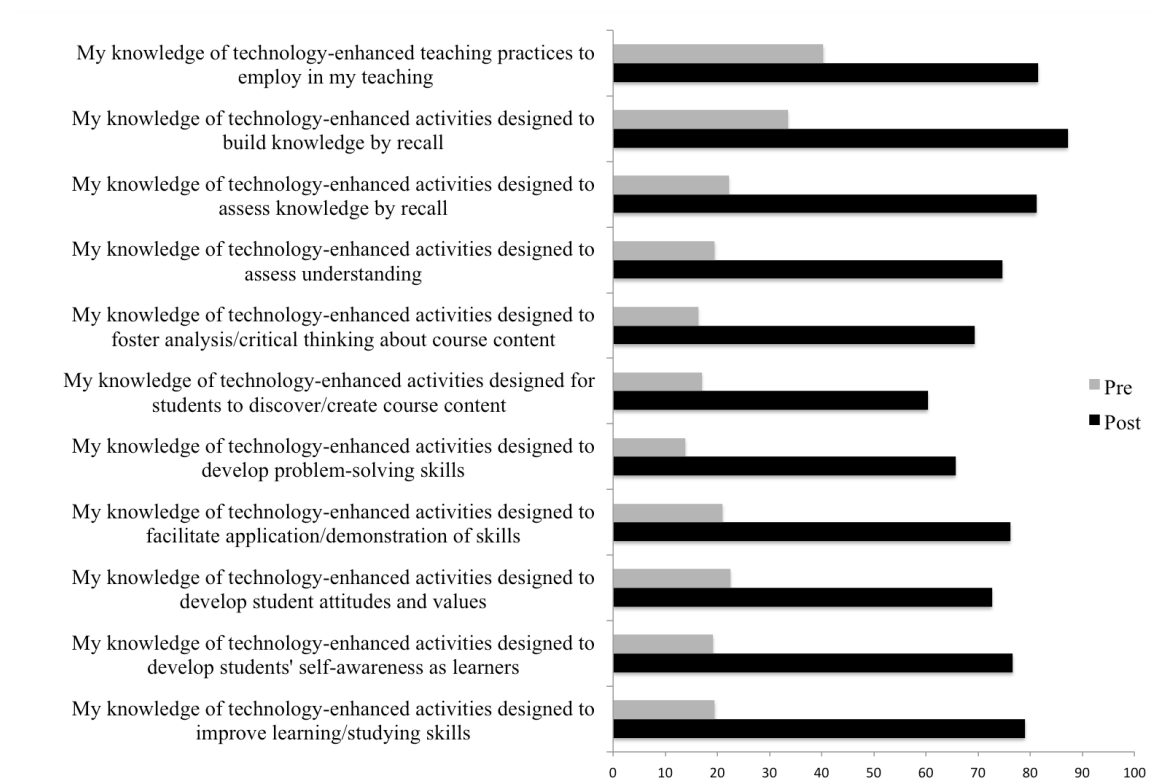
**Figure 13- Cumulative New Practices Throughout the Study for Participant 106**

**Table 3- New Teaching Practices Adopted by Participants**

| Practice   | Number of Participants |
|--|------------------------|
| Kahoot - <a href="https://getkahoot.com/">https://getkahoot.com/</a>                               |                        |
| To review lesson content   | 5                      |
| As a pre-test of existing knowledge  | 2                      |
| Nearpod- <a href="https://www.nearpod.com/">https://www.nearpod.com/</a>                           |                        |
| Draw function in Nearpod   | 4                      |
| Multiple choice question in Nearpod  | 4                      |
| Open-ended response question in Nearpod  | 4                      |
| Web page embedded in Nearpod that students search for information                                  | 4                      |
| Using Nearpod to deliver lecture material  | 3                      |
| Poll question in Nearpod   | 3                      |
| True False questions in Nearpod  | 2                      |
| Fill in the blanks in Nearpod  | 2                      |
| Quiz in Nearpod  | 1                      |
| Seesaw- <a href="http://web.seesaw.me/">http://web.seesaw.me/</a>                                  |                        |
| Notes function in Seesaw   | 2                      |
| Draw function in Seesaw  | 1                      |
| Upload link function in Seesaw   | 1                      |
| Comment function in Seesaw   | 1                      |
| Websites embedded into Seesaw that students navigate   | 1                      |
| Google Forms - <a href="https://www.google.ca/forms/about/">https://www.google.ca/forms/about/</a> |                        |
| Google Form for muddiest point   | 2                      |
| Google Form for team feedback  | 1                      |
| Google Form to gather information from students  | 1                      |
| Google search for course related content   | 5                      |
| Answergarden to poll students  | 4                      |
| Use LMS to locate a resource for use in an activity  | 3                      |
| Using a QR code reader   | 2                      |
| Navigate to website and complete an interactive activity   | 2                      |
| Search for and view a video of a course concept  | 1                      |
| Use a course specific app to learn content   | 1                      |
| Take a photo of course concept and post to LMS or Twitter  | 1                      |
| Create and upload a video demonstrating course concepts to LMS                                     | 1                      |
| Quizlet to practice terminology  | 1                      |
| Padlet to post all student's responses to a question   | 1                      |
| Survey Monkey questionnaire to gather information  | 1                      |
| Create memes related to course content   | 1                      |
| Develop definitions for course concepts based on internet search                                   | 1                      |
| Witti Comics to create comics depicting course-related content                                     | 1                      |

## 4.4 Pre-Post Retrospective Survey, and Treatment Acceptability

To assess changes in knowledge, participants were asked to retrospectively rate their knowledge related to eleven types of learning activities before the intervention began. Participants were then asked to rate their current knowledge at the conclusion of the intervention for the same eleven types of learning outcomes. Participants could choose a score between 0-100 for both ratings. This served as the pre-post measure of knowledge change. A Wilcoxon signed-rank test was used to analyse the results of the pre-post retrospective survey. The Wilcoxon signed-rank test is a non-parametric statistical test appropriate for use when a single group of participants are assessed on more than one occasion. It can also be applied with very small sample sizes, as was the case in this study. The analysis was conducted using IBM SPSS Statistics version 23. The results showed that participants reported a statistically significant ( $p < .05$ ) difference in their knowledge levels related to all types of learning outcomes assessed when reflecting on the knowledge they possessed at the outset of the intervention versus the knowledge they possessed at the conclusion of the intervention. Details are presented in Figure 14.



**Figure 14- Mean Scores Across Participants for Pre/Post Retrospective Survey Items**

Treatment acceptability was assessed by asking participants for their perspective on the quality and efficacy of the intervention. Three four-point rating scale questions (range 1-4) and three open-ended questions were administered. When asked to rate the quality of the training received, all participants indicated that they felt the training they received was “very good” the highest possible rating on the scale. In addition, all participants said that they would be “very likely” to recommend the training to someone else, also the highest possible rating on the scale. Five participants reported the training had impacted their teaching practices “an extreme amount” the highest possible rating, while one participant indicated the training had “some” impact on his/her teaching practice, the second highest rating. Table 4 describes the mean rating and standard deviation for the rating scale items.



**Table 4- Mean Rating and Standard Deviation (SD) for Items 12-14 on the Post-Intervention Survey**

| Item  | <i>Mean</i> | <i>SD</i> |
|---|-------------|-----------|
| 12. How would you rate the quality of the training you received?  | 4           | 0         |
| 13. What sort of an impact has the training you have received had on your implementation of technology-enhanced teaching practices? | 3.67        | 0.82      |
| 14. What is the likelihood you would recommend this training to other faculty members?  | 4           | 0         |

The open-ended questions provided participants an opportunity to provide details about what they liked about the coaching intervention, what they would recommend to improve the coaching intervention in the future, and any other comments that they wished to share. All participants responded to all three questions.

When asked to identify what they liked about the coaching intervention, some themes emerged. Participants indicated that they liked the demonstration of new learning activities each week, the small group structure, having time to design an activity for their own context within the weekly meeting, being accountable to the group through goal setting, having support and feedback from their peers and having a set meeting time.

Recommendations to improve the intervention included extending the intervention to all full and part-time faculty, customizing the training by department, school, or mobile device, further leveraging the college learning management system within the sessions, using the current participants as mentors for other teachers who might be interested in the approach, reducing the focus on a numeric target during goal setting, and potentially eliminating the in-class observations.

When asked for further comments, several participants suggested that the training model should be widely adopted by the college. They also expressed positive sentiments about their experience in the group with some expressing a desire to continue with the intervention after the formal conclusion of the study. One participant indicated that the training had “broken down the stigma” associated with teaching with technology while another said “without this I am not sure I could have successfully implemented the technology in my classroom.”

Overall, participants reported high satisfaction with the intervention.

The behavioural coaching intervention resulted in changed faculty teaching behaviour as measured through direct observation of teaching sessions. All participants adopted several new teaching practices over the course of the intervention and many participants met or exceeded their personal performance targets from week to week. Participants reported statistically significant ( $p < .05$ ) changes in their knowledge related to all types of learning outcomes assessed when they rated their knowledge at the beginning of the intervention versus their knowledge at the end of the intervention. Participants were also highly satisfied with the intervention, with all participants indicating that they would be very likely to recommend the training to others and several suggesting that the behavioural coaching model of professional development should be adopted college-wide.

## Chapter 5

### 5 Discussion

#### 5.1 Intervention Effects

Students learn better when they are actively engaged (Freeman et al., 2014; Nelson & Crow, 2014; Prince, 2004). Developing exercises to engage students within the college classroom is challenging. Faculty members are unlikely to adopt new teaching approaches without the support of a comprehensive professional development plan. Based on a review of the research literature, it was hypothesized that a behavioural coaching intervention delivered in a small group composed of instruction, modeling, rehearsal, performance feedback, and goal setting could be an effective form of professional development for college faculty members motivated to incorporate technology-enhanced teaching practices within their classroom.

The primary purpose of this study was to evaluate the effects of behavioural coaching on faculty adoption of technology-enhanced teaching practices. It was not the intent of the study to conduct a component analysis, evaluating which specific aspects of the intervention had the greatest impact on participant behaviour change. However, it can be noted that when asked to identify what components of the intervention they liked, participants identified modeling, rehearsal, and goal setting as valuable components of the intervention. Several participants also indicated that the small group format was beneficial as it provided opportunities for participants to learn from one another. This study tried to answer three questions. First, did the training intervention result in participants adopting technology-enhanced teaching practices? Second, did their rate of adoption correspond with their self-selected goals? Third, were participants satisfied with the coaching experience?

With respect to question one, participants within this study did adopt technology-enhanced teaching practices. All participants' weekly frequency of TETP's increased from baseline throughout the intervention phase. In addition, all participants adopted several new teaching practices over the course of the semester. This finding held independent of all demographic factors collected, including total years of teaching experience, previous experience teaching

within a mobile learning program, class size, and mobile device selected. This suggests that within this small group, both experienced and novice faculty members, teaching a variety of subjects, with varied class sizes, benefitted from the training approach.

The results related to question two, did participants rate of adoption correspond with their self-selected goals, were less clear. For some participants (103, 104, 105, & 106), there was good correspondence between goals stated and weekly performance. For other participants (101 and 102), there was poor correspondence between goals stated and weekly performance.

In an attempt to clarify the relationship between the intervention and participant behaviour a return to baseline phase, was implemented for four participants. For one week, participants were asked to take a break from the intervention. They did not attend the coaching session and were asked to not set a personal performance goal. For each of these participants, the return to baseline resulted in a decrease in the frequency of TETP's demonstrated. This strengthened the demonstration of experimental control as when the intervention was withdrawn, participant performance decreased. Two participants did not agree to participate in the return to baseline phase (101 and 102). Both participants indicated that they had already planned out their lesson for the following week, had set their goals, and were implementing previously discussed practices.

Across all participants, when goals were not met, it was more common that performance exceeded the target than failed to meet the target. While practically speaking this might seem a success, it presents a challenge with respect to the demonstration of experimental control. Traditionally within the changing criterion design, the researcher sets the performance criteria and controls the delivery of reinforcement, only providing it when the participant meets the criteria set. There are no additional reinforcers delivered for exceeding the goal. In this study, participants set their own goals, and while the researcher provided praise and encouragement contingent on goals being met, she did not have control over all reinforcers that influenced each participant's teaching behaviours. It is likely that participants accessed other reinforcers outside the researcher's control when they exceeded their personal performance goals. These reinforcement contingencies may have encouraged exceeding performance goals set.

Over the course of the intervention, the training group developed into a supportive community of practice. When participants failed to meet their performance goals, other group members offered words of reassurance and praised them for the practices that they were successfully implementing. When participants exceeded their weekly targets, other group members provided vigorous praise and encouragement for outperforming their personal targets. It is possible that the feedback provided by group members was equally or more powerful than that provided by the researcher.

Other contingencies may have influenced participant behaviour outside of the training sessions. During weekly coaching sessions, participants discussed feedback that they received from students related to their teaching practice. Typically the feedback was informally given (e.g., statements of enthusiasm when a particular teaching practice was launched or statements of complaint when directed to perform a specific task). Participants were not immune to these responses. They may have influenced performance levels independent of the goals publicly stated during weekly training sessions. Participant workload is another variable that the researcher was not able to control. When unexpected tasks presented, participants may have been unable to meet the performance goal that they set despite their best intentions.

Finally, the two participants whose data showed the poorest correspondence to personal goals set (101 and 102) were also the two participants who were implementing the highest frequency of TETP's in their classrooms. It is possible that setting precise goals becomes more difficult as the target increases. It may be easier to plan for and meet a goal of 3 TETP's than it is to meet a goal of 12.

In response to question three, were participants satisfied with the coaching experience, the results were very positive. All participants indicated that they would be "very likely" to recommend the training to others and that they found the quality of the training to be "very good." In addition, three participants suggested that the training model should be extended to all faculty members at the college. This group of participants was highly satisfied with the intervention.

## 5.2 Limitations

Four significant limitations exist in the present study. First, the small sample included self-nominated participants within a community college that had adopted a mandate to incorporate mobile learning technology within its programs. As such it is questionable whether the results of the study can be generalized to other participants at this community college or to faculty members at institutions of higher education more broadly. Within single-case research designs external validity is demonstrated when the results of a study are replicated across increasingly varied situations. To establish external validity this research study should be the first in a series of replication studies.

Second, there were limitations associated with the experimental design. Within single-case research designs, a critical component to establish experimental control is the observation of a stable baseline rate of responding from which to evaluate the effects of the intervention. Within this study, the baseline phase was brief, lasting no more than two weeks. This was necessary as there was an expectation that the participants were actively incorporating technology into their classrooms from the beginning of the academic semester. For some participants, the shortened baseline phase was not of major concern. For example, baseline data for participant 103 showed no instances of TETP's demonstrated in either of the two observations. For other participants, when the data were variable and/or on an increasing trend as was the case for participant 102, it would have been beneficial to extend the baseline phase to determine whether the participant's behaviour would continue to change without intervention. In addition, for some participants, the correspondence between goals set and performance was not clear. As has already been discussed, this pattern of responding suggests that the experimenter did not have control over the most powerful reinforcers for the target behaviour. Lastly, the maintenance phase of the intervention was brief. This was a function of the courses ending as the end of the academic semester was reached. Ideally, the maintenance phase would have lasted for several weeks to allow for a better assessment of the durability of the intervention results.

Third, the method of measurement selected to monitor participant performance was, relatively speaking, insensitive. Choosing to record the frequency of TETP's implemented per week did not provide any information about what proportion of class time students spent

actively engaged with TETP's. It is also possible that the focus on frequency inadvertently biased participants towards choosing TETP's that were of relatively short duration so that they could continue to increase their performance goals from week to week.

Finally, there was no measure of the impact of participants' teaching practices on students in their class. Previous research has demonstrated that students learn better in classrooms where they are actively engaged (Freeman et al., 2014; Nelson & Crow, 2014; Prince, 2004). It would have been ideal to evaluate student learning and assess student perspectives related to their instructor's use of TETP's within the classroom.

### 5.3 Implications for Practice

Despite the limitations noted above, overall, the intervention employed in this study was successful in supporting college faculty members to adopt new teaching practices. Leaders within higher education should evaluate the feasibility of incorporating a coaching model based on BST within their professional development offerings when they aim to teach faculty members demonstrable skills. Consultation with an individual with knowledge and experience in ABA and BST would be advisable during the development stage.

Using a BST model for faculty professional development provides the opportunity for participants to be actively engaged in the training process. Given that we know students learn better when they are actively engaged (Freeman et al., 2014; Nelson & Crow, 2014; Prince, 2004), it stands to reason that faculty would also learn better during professional development sessions when they are actively engaged.

Consistent with earlier research findings (Haviland et al., 2010; Huston & Weaver, 2008; Romano et al., 2004), the participants in this study reported that working in a small group with a dedicated meeting time was important to the success of the intervention. When developing training schedules, leaders should consider how to facilitate the formation of consistent small groups to set the stage for the development of communities of practice (Wenger, 2010).

Several participants also indicated that publicly stating their performance goals was important for their success. When training sessions are to be delivered in a series,

individuals responsible for professional development should determine how to include public goal setting in each session. Goals should be determined by the individual and be concrete and objective in nature so that they can be easily evaluated in subsequent sessions. Trainers should record the goals stated. Structuring training sessions to provide an opportunity for individuals to report out on their performance will provide an opportunity for feedback on performance within the small group, setting the stage for meaningful behaviour change.

Finally, professional development approaches with college faculty members should be collaborative in nature. College faculty members have a great deal of discretion over how they teach their classes. If they are not consulted during the development of a training intervention or do not feel like partners in the implementation phase, it may be more difficult to engage them in the process.

## 5.4 Implications for Future Research

This study extends the research literature by evaluating the effects of a professional development intervention through the use of direct observation of faculty members teaching practices. Future research should investigate whether the intervention effects can be replicated across other participant groups both within the college where this study was conducted, and more broadly, within higher education. Future researchers may also choose to investigate the influence of other constructs such as cognition and affect on changing instructional practice. In addition, consideration should be given to the experimental design selected. In cases where the researcher may not have control over the majority of reinforcers for the target behaviour, it may be wise to use a simpler experimental design such as the reversal to attempt to demonstrate experimental control.

Future researchers may want to consider using an interval recording system to evaluate the implementation of TETP's within the classroom. Opting to use a partial-interval system would provide an estimate of the duration of the class period that students were engaged in TETP's. If the goal is to have students actively engaged for as much of the class period as possible, a time-based measurement system might be more appropriate.

Within future investigations it would be interesting to determine which components of the intervention are required to demonstrate effects. Within this study, continuous direct



observations were conducted; this demanded a significant amount of observation time. It would be valuable to know if the intervention could be equally effective relying on data reported weekly by participants independent of continuous observation. Future research may also look to collect data from students related to their perspectives on the TETP's implemented by their instructors.

## 5.5 Conclusions

The purpose of this study was to evaluate the effects of a behavioural coaching intervention on faculty members' adoption of technology-enhanced teaching practices within their classrooms. Results from this study suggest that the intervention was effective, as all participants adopted new teaching practices over the course of the intervention. As research in the area of professional development for faculty members in higher education continues, more researchers should give consideration to the use of single-case experimental designs as a method of evaluation. Collecting data on observable teaching practices allows for a more objective assessment of the impact of an intervention. When professional development budgets are limited, administrators want to be assured that the training they are supporting will have a measurable impact on participant behaviour. Drawing on the field of applied behaviour analysis will allow for the design and implementation of individualized training approaches that result in socially significant behaviour change.

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## Appendices

### Appendix 1- Technology-Enhanced Teaching Practice Checklist Form

|                          | Task  | Notes |
|--------------------------|---|-------|
| <input type="checkbox"/> | Identify a lesson where there are several terms that students will need to be able to define in order to succeed in the course.   |       |
| <input type="checkbox"/> | Create a list of terms.   |       |
| <input type="checkbox"/> | Decide whether you would like to create a class, where all of your students could share their study sets.   |       |
| <input type="checkbox"/> | If you want to create a class for sharing, create an account by going to quizlet.com. Click 'Sign up' on the top right of the screen, enter your information and click 'Sign up'  |       |
| <input type="checkbox"/> | Once you are logged in, find 'Your Classes' on the left side, then click 'Create a Class'   |       |
| <input type="checkbox"/> | Give your class a name, description (if you like) and enter your school name. Then click 'Create class'   |       |
| <input type="checkbox"/> | To give your students access to your class, click 'Add members' then choose 'automatic join link'. Copy the link that is displayed to your clipboard, and post the link in your course website, telling students how they might choose to use it. |       |
| <input type="checkbox"/> | Ask students to download Quizlet to their mobile device before class. If a student is using a laptop, no download is required, they just go to quizlet.com  |       |
| <input type="checkbox"/> | Students should create an account. They can login with Facebook, their Google credentials, or an email address.   |       |
| <input type="checkbox"/> | During class, share your list of terms with students. Ask if they have additional terms they would like added to the list.  |       |
| <input type="checkbox"/> | Provide students time to create a study set.  |       |
| <input type="checkbox"/> | Once the terms are completed (or time you have allowed for this phase has expired) ask students to find a partner to review their terms.  |       |
| <input type="checkbox"/> | If the students find they have different definitions, they should return to their notes or consult with another pair to determine the correct answer.   |       |
| <input type="checkbox"/> | Students can share their sets with one another via email, facebook, twitter, pintrest, or by adding them to your class if you chose to set up that option. Additional study options are available when students access their cards on a computer. |       |



## **Appendix 2- Faculty Needs Assessment**

1. Are you currently employed at [NAME] College
  - a. Full Time
  - b. Part Time
2. How many years of full-time post-secondary teaching experience do you have?
3. How many years of part-time post-secondary teaching experience do you have?
4. What academic school are you affiliated with?
  - a. Business and Creative Design
  - b. Community Services and Liberal Studies
  - c. Fire Science and Public Safety
  - d. Health Sciences, English, and Humanities
  - e. Technology, Energy, and Apprenticeship
5. On average, how many students are enrolled in your classes?
  - a. 1-20
  - b. 21-35
  - c. 36-50
  - d. 51+
6. What mobile device has been chosen for your program?
  - a. iPad
  - b. Laptop
  - c. Smart Phone
  - d. Tablet
  - e. Unspecified
  - f. I don't know
7. How many semesters have you taught in a mobile learning program?

8. Please indicate your interest in learning how to use technology to enhance the following types of class activities

|  | Not at all<br>interested | Somewhat<br>interested | Very<br>interested |
|--|--------------------------|------------------------|--------------------|
| Activities designed to build knowledge by recall                               |                          |                        |                    |
| Activities designed to assess knowledge by recall                              |                          |                        |                    |
| Activities designed to assess understanding                                    |                          |                        |                    |
| Activities designed to foster analysis/ critical thinking about course content |                          |                        |                    |
| Activities designed for students to discover/create course content             |                          |                        |                    |
| Activities designed to facilitate application/ demonstration of skills         |                          |                        |                    |
| Activities designed to develop student attitudes and values                    |                          |                        |                    |
| Activities designed to develop students' self-awareness as learners            |                          |                        |                    |
| Activities designed to improve learning/studying skills                        |                          |                        |                    |

9. When would you be available for weekly coaching sessions? Please select all that apply

|           | 7:30-<br>9:30<br>am | 9:30-<br>11:30<br>am | 11:30-<br>1:30<br>pm | 1:30-<br>3:30<br>pm | 3:30-<br>5:30<br>pm | 5:30-<br>7:30<br>pm | 7:30-<br>9:30<br>pm | Other |
|-----------|---------------------|----------------------|----------------------|---------------------|---------------------|---------------------|---------------------|-------|
| Monday    |                     |                      |                      |                     |                     |                     |                     |       |
| Tuesday   |                     |                      |                      |                     |                     |                     |                     |       |
| Wednesday |                     |                      |                      |                     |                     |                     |                     |       |
| Thursday  |                     |                      |                      |                     |                     |                     |                     |       |
| Friday    |                     |                      |                      |                     |                     |                     |                     |       |

10. If there are specific times you would prefer the training to occur, please list them below.

### **Appendix 3- Study Data Sheet**

Please enter the date of the observation as DD/MM/YY

Please enter the start time of the observation. Please indicate am or pm.

Please enter the end time of the observation. Please indicate am or pm

Please select the appropriate participant code.

101

102

103

104

105

106

Record the number of students present at the scheduled class start time (for example, at 9:30am)

0-20

21-35

36-50

51 +

Please record the number of Technology-Enhanced Teaching Practices Observed. Remember the definition of a technology enhanced teaching practice(TETP) is "An activity or instruction presented by the instructor that requires the student to do something, using technology as one of their tools" Exclusionary criteria "demonstrating computer software or modelling how to navigate course websites or college directory files" A single TETP may be comprised of several student responses. For example, a kahoot activity may have 1, 3, or 10 questions. If they were delivered consecutively, this would count as 1 TETP regardless of the number of questions asked. A TETP ends when the instructor either resumes lecture style instruction, or moves onto another activity that may or may not use technology.

Please describe each technology-enhanced teaching practice (TETP) you observed. A short sentence or two will suffice.

TETP 1

TETP 2

TETP 3

TETP 4

TETP 5

TETP 6

TETP 7

TETP 8

TETP 9

TETP 10

TETP 11

TETP 12

TETP 13

TETP 14

TETP 15

TETP 16

TETP 17

TETP 18

TETP 19

TETP 20

Powered by Qualtrics

## Appendix 4- Faculty Needs Assessment

### Post-Intervention Survey-Adapted from Popovich, Peverly, & Jackson, 2006

Your participation in collecting information about your development as a faculty member is very important. It allows us to assess the impact of the behavioural coaching intervention. Additionally, this information will be used to improve future coaching sessions.

Your participation in this survey is **voluntary** and your responses considered **confidential/anonymous**.

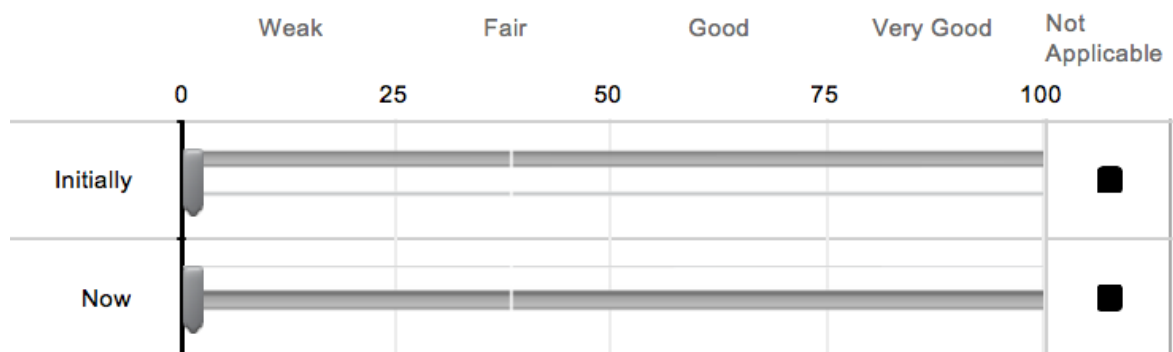
Thank you for your support and participation.

Using the scale provided, please rate each statement by selecting the response that best describes:

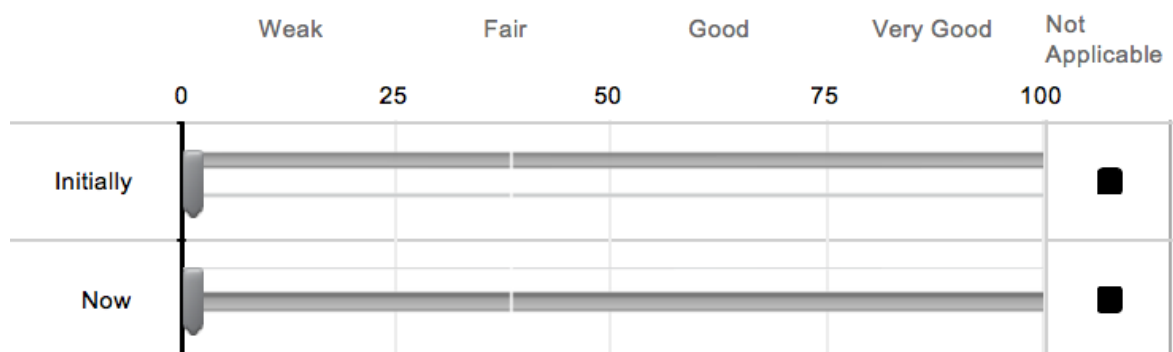
How you initially felt before the Behavioural Coaching Intervention began.

How you feel now after the Behavioural Coaching Intervention has concluded.

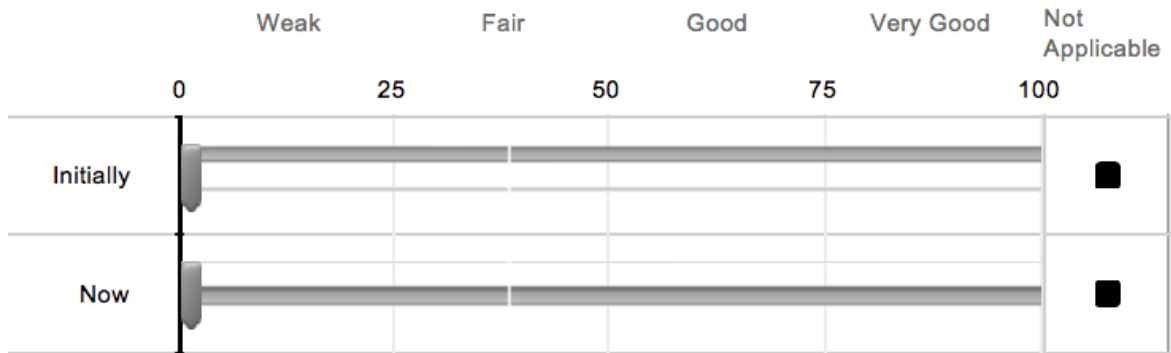
My knowledge of technology-enhanced teaching practices to employ in my teaching.



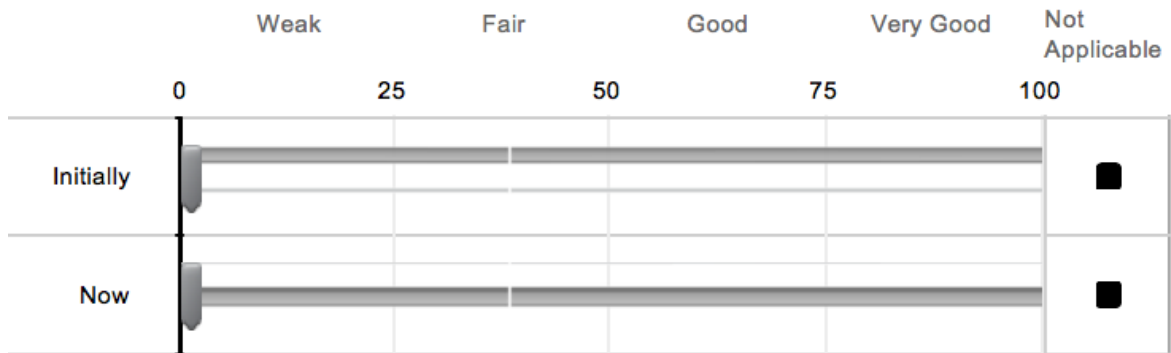
My knowledge of technology-enhanced activities designed to **build** knowledge by recall.



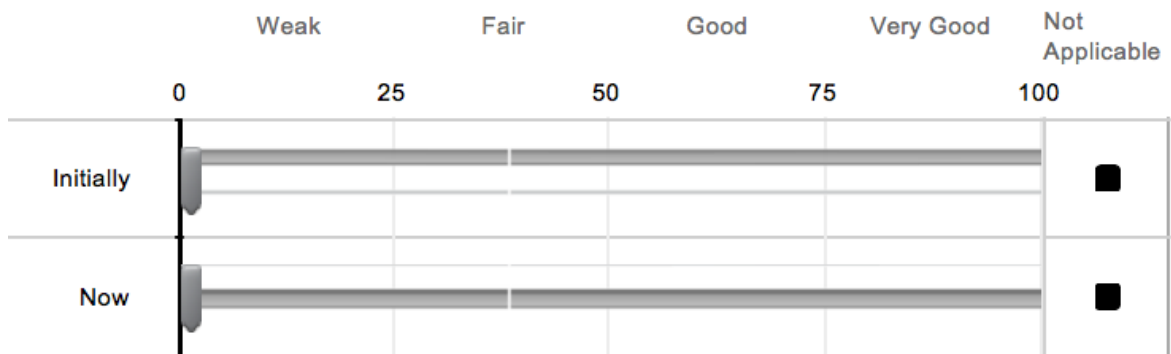
My knowledge of technology-enhanced activities designed to **assess** knowledge by recall.



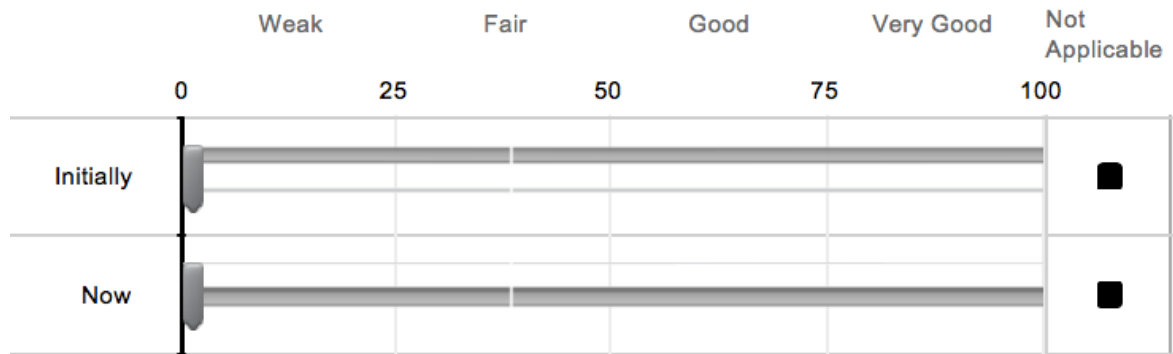
My knowledge of technology-enhanced activities designed to assess understanding.



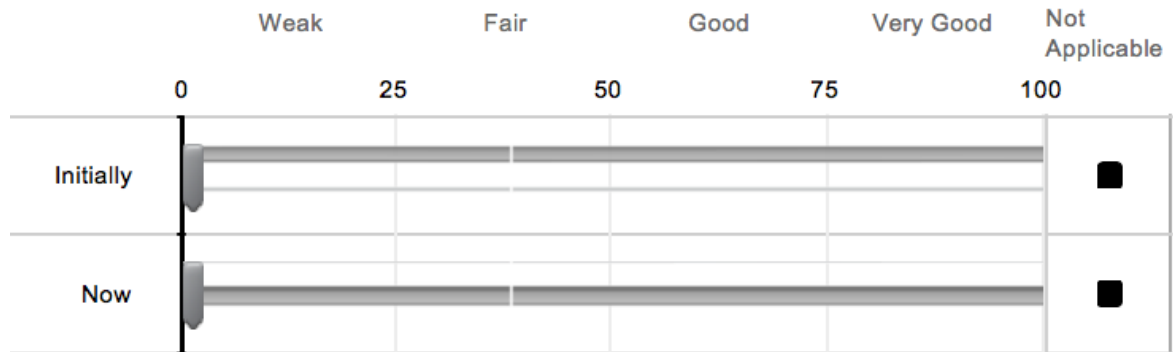
My knowledge of technology-enhanced activities designed to foster analysis/critical thinking about course content.



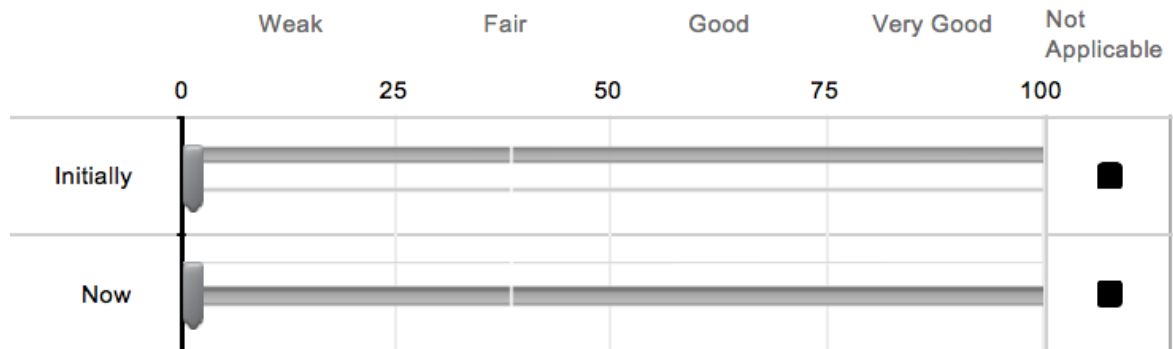
My knowledge of technology-enhanced activities designed for students to discover/create course content.



My knowledge of technology-enhanced activities designed to develop problem-solving skills.

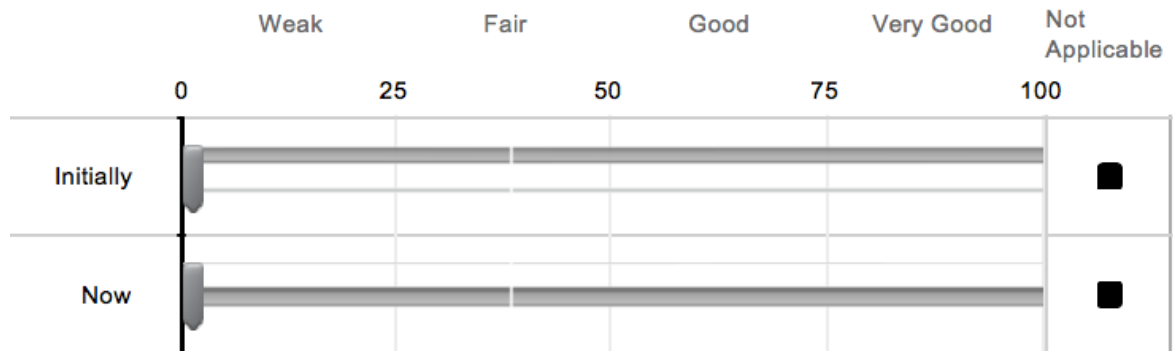


My knowledge of technology-enhanced activities designed to facilitate application/demonstration of skills.

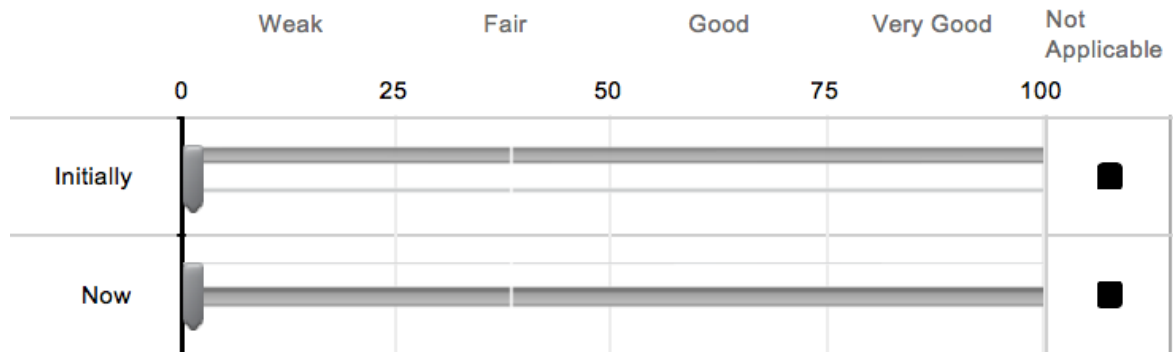




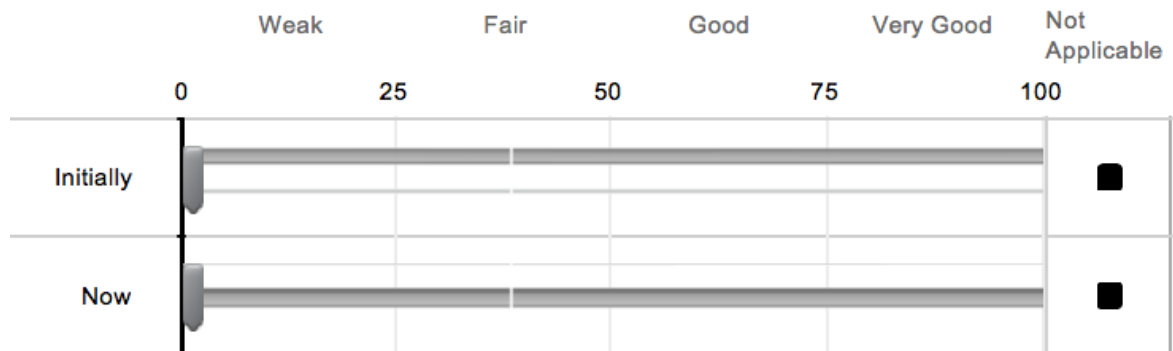
My knowledge of technology-enhanced activities designed to develop student attitudes and values.



My knowledge of technology-enhanced activities designed to develop students' self-awareness as learners.



My knowledge of technology-enhanced activities designed to improve learning/studying skills.



The following questions will ask for your evaluation of the behavioural coaching intervention as a whole.

How would you rate the quality of the training you received?

Very Bad



Bad



Good



Very Good



What sort of an impact has the training you have received had on your implementation of technology-enhanced teaching practices?

None



Some



Quite a Bit



An Extreme Amount



What is the likelihood you would recommend this training to other faculty members?

Very Unlikely



Unlikely



Likely



Very Likely



What did you like about the behavioural coaching intervention?

What would you recommend to improve the behavioural coaching intervention in the future?

Do you have any additional comments/observations about the behavioural coaching intervention to share?

## **Appendix 5: Letter of Information and Consent Form**

**Project Title:** Evaluation of the effect of a behavioural coaching intervention on faculty adoption of technology-enhanced teaching practices

**Principal Investigator:** Vicki Schwean, PhD., Faculty of Education, Western University

**Co-Investigator:** Nicole Domonchuk, M.A., BCBA, Student Researcher, Faculty of Education, Western University

### **Letter of Information**

#### **1. Invitation to Participate**

You are being invited to participate in this research study which will investigate the effect of a behavioural coaching intervention on faculty adoption of technology-enhanced teaching practices because you are a faculty member at [NAME] College who will be teaching in a mobile learning program in the fall 2015 semester. If you are interested in improving your use of technology within the classroom you may wish to consider enrolling.

#### **2. Purpose of the Letter**

The purpose of this letter is to provide you with information required for you to make an informed decision regarding participation in this research.

#### **3. Purpose of this Study**

As part of the co-investigator's EdD dissertation, the purpose of this study is to develop, implement, and evaluate the impact of an individualized behavioural coaching intervention on faculty adoption of technology-enhanced teaching practices. Specifically, this study seeks to answer the following questions:

- Do participants adopt technology-enhanced teaching practices?
- Does their rate of adoption correspond with their self-selected goals?
- Are participants satisfied with the coaching experience?

#### **4. Inclusion Criteria**

Individuals who will be teaching at least one course in a mobile learning program at [NAME] College in the fall semester of 2015, and who obtain a written letter of support for their participation in this study from their academic dean are eligible to participate in this study. Both full-time and part-time faculty are welcome to participate.

## **5. Exclusion Criteria**

Individuals who are not teaching a course in a mobile learning program in the fall semester of 2015, or who are unable to secure a written letter of support for their participation from their academic dean are not eligible to participate in this study.

## **6. Study Procedures**

If you agree to participate, the co-investigator will ask you to do several things as part of this training intervention. You will not have direct contact with the principal investigator. First, you will be asked to complete a needs assessment, indicating content areas that interest you for future training. You must consent to having all of the class periods you teach within a mobile learning program observed for data collection purposes. In addition, at least 30% of your teaching sessions will be videotaped to allow for a check on the reliability of the data collected. These videos will not be used for any other purpose. You will also be asked to participate in weekly coaching sessions. Sessions will be approximately two hours in length and will occur from one week before the start of the fall semester until four weeks into the winter academic semester. You will be asked to come to these sessions having identified the learning outcomes for your teaching periods in the coming week. Within these coaching sessions you will be asked to participate in classroom simulation activities. You will also be asked to complete lesson plans during the coaching session to support your implementation of technology-enhanced teaching practices. In addition, you will set and publicly state your own performance goals each week. Finally, you will be asked to reflect on your performance each week via an electronic survey. It is anticipated that it will take 60 hours to complete this study; approximately 40 hours in face-to-face activities and 20 hours of individual preparation and reflection. All study sessions will be conducted at [NAME] College, scheduled at a time that is convenient for participants. There will be a total of four to eight participants in this investigation.

## **7. Possible Risks and Harms**

The possible risks and harms to you include

- Discomfort with the observation and intermittent video recording of your teaching sessions.
- Feeling psychological or emotional stress if you are unsuccessful in meeting the goal you publicly stated.
- Obtaining poorer student evaluations as you incorporate new teaching techniques in the classroom.

## **8. Possible Benefits**

The possible benefits to you include:

- Access to additional professional development to assist you in incorporating technology into your teaching approach.
- You may create new collegial relationships that could provide benefit beyond the end of the study in a community of practice.
- You may develop increased confidence in your teaching abilities.
- You will receive copies of all training materials, which may be of value to you as you continue developing technology-enhanced teaching approaches to college instruction.
- Obtaining improved student evaluations as you incorporate new teaching techniques in the classroom.

The possible benefits to society include:

- A contribution to the faculty professional development literature.
- The discovery of an effective way to support faculty in acquiring new teaching skills.

## **9. Compensation**

You will not be compensated for your participation in this research by the researchers.

## **10. Voluntary Participation**

Participation in this study is voluntary. You may refuse to participate, refuse to answer any questions or withdraw from the study at any time with no effect on your future employment.

## **11. Confidentiality**

All data collected will remain confidential and accessible only to the investigators of this study. If the results are published, your name will not be used. If you choose to withdraw from this study, your data will be removed and destroyed from our database. While we will do our best to protect your information there is no guarantee that we will be able to do so. Representatives of The University of Western Ontario Non-Medical Research Ethics Board may contact you or require access to your study-related records to monitor the conduct of the research.

## **12. Contacts for Further Information**

If you require any further information regarding this research project or your participation in the study you may contact Vicki Schwean, and/or Nicole Domonchuk.

If you have any questions about your rights as a research participant or the conduct of this study, you may contact The Office of Research Ethics.

### **13. Publication**

If the results of the study are published, your name will not be used. If you would like to receive a copy of any potential study results, please contact Nicole Domonchuk.

### **14. Consent**

You will indicate your consent to participating in this research study by signing a written consent form found on the following page.

*This letter is yours to keep for future reference.*

## **Consent Form**

**Project Title:** Evaluation of the effect of a behavioural coaching intervention on faculty adoption of technology-enhanced teaching practices

**Study Investigator's Name:** Vicki Schwean & Nicole Domonchuk

I have read the Letter of Information, have had the nature of the study explained to me and I agree to participate. All questions have been answered to my satisfaction.

Participant's Name (please print): \_\_\_\_\_

Participant's Signature: \_\_\_\_\_

Date: \_\_\_\_\_

Person Obtaining Informed Consent (please print): \_\_\_\_\_

Signature: \_\_\_\_\_

Date: \_\_\_\_\_

## Appendix 6: Ethics Approval



Western  
Research

Research Ethics

Western University Health Science Research Ethics Board  
NMREB Delegated Initial Approval Notice

Principal Investigator: Dr. Vicki Schwan  
Department & Institution: Education, Western University

NMREB File Number: 106380

Study Title: Evaluation of the effect of a behavioural coaching intervention on faculty adoption of technology-enhanced teaching practices

Sponsor:

NMREB Initial Approval Date: April 08, 2015

NMREB Expiry Date: April 08, 2016

Documents Approved and/or Received for Information:

| Document Name                           | Comments   | Version Date |
|---|--|--------------|
| Other                                   | Appendix C- Technology-Enhanced Teaching Practice Behaviour Checklist- Lesson Planning Tool Developed for the Study  | 2015/02/10   |
| Instruments                             | Appendix G- Behavioural Coaching to Incorporate Technology-Enhanced Teaching Practices Post-Intervention Survey- Adapted Instrument  | 2015/02/10   |
| Data Collection Form/Case Report Form   | Appendix F- Weekly Faculty Reflection Form Please note, there is logic built into the survey such that participants will be directed to relevant questions based on their responses. Additionally, a new form will be sent weekly to participants. | 2015/02/10   |
| Data Collection Form/Case Report Form   | Appendix E- Classroom Observation Form   | 2015/02/10   |
| Other                                   | Appendix D- Graphic Sample of Changing Criterion Design  | 2015/02/10   |
| Instruments                             | Appendix B- Faculty Needs Assessment- New Instrument   | 2015/02/10   |
| Other                                   | Appendix J- References   | 2015/02/10   |
| Recruitment Items                       | Appendix H- Recruitment Email  | 2015/02/02   |
| Other                                   | Appendix A- Visual Representation of the Study   | 2015/02/02   |
| Revised Western University Protocol     | Western Protocol Version 2   | 2015/03/17   |
| Revised Letter of Information & Consent | Appendix I- Letter of Information and Consent Form- Version 2  | 2015/03/17   |

The Western University Non-Medical Research Ethics Board (NMREB) has reviewed and approved the above named study, as of the NMREB Initial Approval Date noted above.

NMREB approval for this study remains valid until the NMREB Expiry Date noted above, conditional to timely submission and acceptance of NMREB Continuing Ethics Review.

The Western University NMREB operates in compliance with the Tri-Council Policy Statement Ethical Conduct for Research Involving Humans (TCPS2), the Ontario Personal Health Information Protection Act (PHIPA, 2004), and the applicable laws and regulations of Ontario.

Members of the NMREB who are named as Investigators in research studies do not participate in discussions related to, nor vote on such studies when they are presented to the REB.

The NMREB is registered with the U.S. Department of Health & Human Services under the IRB registration number IRB 00000941.

Ethics Officer, on behalf of Riley Hinson, NMREB Chair or delegated board member

Ethics Officer to Contact for Further Information

|                                       |   |                                       |                                     |
|---------------------------------------|---|---------------------------------------|-------------------------------------|
| <input type="checkbox"/> Erika Basile | <input checked="" type="checkbox"/> Grace Kelly | <input type="checkbox"/> Mina Mekhail | <input type="checkbox"/> Vikki Tran |
|---------------------------------------|---|---------------------------------------|-------------------------------------|

*This is an official document. Please retain the original in your files.*



# Curriculum Vitae

|  |  |
|--|--|
| <b>Name:</b>                                 | Nicole M. Domonchuk  |
| <b>Post-secondary Education and Degrees:</b> | McMaster University<br>Hamilton, Ontario, Canada<br>1998-2002 Hons. B.A. Psychology and Gerontology<br><br>The University of Nevada Reno<br>Nevada, Reno, USA<br>2002-2005 M.A. Psychology<br><br>The University of Western Ontario<br>London, Ontario, Canada<br>2013-2016 EdD Educational Leadership |
| <b>Related Work Experience</b>               | College Professor- Autism and Behavioural Sciences<br>Lambton College<br>2003-Present  |